Optimising the design of new build housing in the United Kingdom the case of size and form

Agha, Araz

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OPTIMISING THE DESIGN OF NEW BUILD HOUSING IN THE UNITED KINGDOM: THE CASE OF SIZE AND FORM

By

Araz Agha

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Applicant:

Araz Agha

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Abstract

The house is the most life changing and most expensive product that most people will own in their lifetime. House design and construction is a very complicated process that affects and is influenced by various stakeholders such as government and non-governmental organisations, local authorities, housing developers, the general public, national and international environmental agencies. Even though modern lifestyle requirement has changed dramatically in the last 15 years, UK houses remain amongst the unchanged, smallest, uncharacteristic, energy inefficient and most expensive in Europe, this study provides evidence of the negative consequence of building small houses includes overcrowding, unhealthy and unsustainable developments. Furthermore, replication of the old design and lack of innovation in modern design becomes a trend and resulted only 1 in 4 people prefer to live in new built houses (RIBA 2013). Initially, this research provides insight into many problems associated with new houses built in the last 15 years, in term of small spaces, recycled form design, energy performance, cost, lack of architectural characteristic, marketing difficulties and scarcity of accommodating modern life requirements. Subsequently, addressing most of the factors impacted on the design aspect, such as land price, housing shortage, role of Green Belt, environmental and energy agenda, mind-set, modern lifestyle needs and public involvement in the design process.

However, the focus of this study is an in-depth research into two aspects housing design: Size and Form, investigating the factors affecting the size of newly build houses and form design only. The research also outlines the key issues that led to the current space allowance and the lack of architectural innovation. The study identified and provides suggestions for tackling theses problems and produce healthier more liveable homes that will be adaptable under different future lifestyle changes.

The aim of this study is to 'investigate the factors that influences the current size and form of the newly built houses in the UK' The research has been carried out using a mixed methodology targeting architects, estate agents and professional within the construction industry. Secondary data from governmental agencies and NHBC data has been reviewed to establish the trend in housing design and to understand the key reasons behind replication and recycling old house design (post war or 19th Century housing design).The outcome of this study highlights the necessity of having an immediate action and coordination among all the stakeholders involved in the housing production to optimise the design of new spacial and form design in a way to encourage innovation in design and encourage. The study concludes that providing National Minimum Space Standard is essential in helping the industry meets the minimum expectation liveable spaces that help in meeting the life style demands of 21st Century.

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I dedicate this thesis to my family, my wife, Slivan, my beloved son, Lalo and my daughter, Leera, a source of unending joy and love, have been wonderfully understanding throughout the dissertation process and has been awaiting the day when I would be finished. Now, we will be able to play outside and sing songs of joy, thank you all for your constant support and unconditional love.

I love you all dearly.

Declaration of Authorship

I, Araz Agha Declare that this thesis and the work presented in it are my own and has been generated by me as the result of my own original research.

OPTIMISING THE DESIGN OF NEW BUILD HOUSING IN THE UNITED KINGDOM: THE CASE OF SIZE AND FORM

I confirm that:

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List of Abbreviations and Acronyms

AADL	Automobile Association Developments Ltd
AJ	Architects Journal
BBC	British Broadcasting Corporation
BREEAM	Building Research Establishment Environmental Assessment Methodology
BS	British Standard
CABE	Commission for Architecture and the Built Environment
CCHPR	Cambridge Centre for Housing & Planning Research.
CLG	Communities and local Government
DHF	Doors & Hardware Federation
DfEC	Department for Educations and Skills
HATC	Housing Association Training & Consultancy
HBF	Home Builders Federation
HER	Home Emergency Response
HHA	Habinteg Housing Association
HHSRS	Housing Health and Safety Rating System
IPSOS	Is an independent market research company managed by research professionals
LHDG	Life Homes Design Guide
LV=	Liverpool Victoria Home Insurance Company
MORI	(Market & Opinion Research International)
ONS	Office for National Statistics
ODPM	Office of the Deputy Prime Minister
RIBA	Royal Institute of British Architects
RSHP	Rogers Stirk Harbour & Partners (architecture firm; UK)
UCL	University College London

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Chapter 1 – Introduction

1.1. The area of research

A house is perhaps the most expensive purchase that most people do in their lifetime and most life change events as well. The process of buying or renting can be a fairly stressful experience given the investment of time, money and effort. Housing developers face stiff challenges in the form of politics and government decisions, planning, pressure groups and lobbies, legal and environmental implications besides a host of local, national and EU issues and directives (Eliot 2014).

According to the Department of Communities and Local Government (DCLG 2014), the government has set a target of building 248,000 houses every year in the UK which equates to about 2.5 million new homes by 2025. The question is whether the new build homes in the UK can withstand the scrutiny and comparison with their European equivalent in term of size and form design:

- Comparing with Denmark houses, UK houses are smaller by 80% and 53% smaller compared to the Netherlands (RIBA 2013), both of which are countries much smaller than the UK by area, economy and population density (Graphiq 2014).
- Most designs are at best a replica of post-war houses or a modern recycled version of the age old traditional house (Proud 2014).
- Surveys and research demonstrate that only 1in 4 prefer to live in new build (RIBA 2013).
- By their very nature smaller houses deliver a sense of being or feeling claustrophobic, over-crowded and perhaps unhealthy sustenance (HHSRS 2014).
- Predominantly there seems to be a glut in the architectural creativity in the layout of housing design though this is not true of the super-rich developments of London and the South-East.

This research precisely exemplifies the two vexatious issues that face the UK housing design industry:

- Smallest by area in a like for like comparison with Europe (RIBA 2013).
- Eternal continuity of the traditional outlook and an easily predictable form has perhaps robbed the architectural community of its creativity and stripped the diverse UK communities of its choice.

The highlighted issues are the main key aspects which require a very serious consideration of the developmental ethos of the UK housing design which naturally involves a multitude of parties with vested and other interests to evolve an optimisation strategy that would suit the lifestyle of the 21st century UK and beyond. The Government has set a target to increase the rate of house-building in the UK to a minimum of 248,000 homes per year, based on this target UK will need at least another 2.5 million new homes by 2025 (Holmans 2013).

Table 1: New estimates of housing demand in the UK 2011-2031 (T&CP 2013)

Table 1 shows the set target specified by the U.K. government for the number of houses should be build every year to avoid housing shortage. This number based on the information and data provided by the Office for National Statistics (ONS 2013) as an outcome of studies and researches on population growth and household projections. Population Projections data produce a statistical indication estimate the age and size structure of the population in the future, which should be used for resource management and future planning (ONS 2014). According to the last National Population Projection statistics in 2014, UK population will increase another 9.7 million in the next 25 years, which means the set target of building 243.3 thousand of houses must be achieved to avoid housing crises in term of numbers and price.

Table 2 shows that the government did not achieve this target in the last 15 years. The housing shortage is a continuous problem and the gap of housing shortage is considerably increasing due to population growth especially in urban centres (ONS 2015). If developing houses remain at this level, we will have a shortage of one million homes every seven years (Griffith & Jeffery 2013).

Table 2: Number of homes completed in the UK (DCLG 2014)

People are depending on Architects, planning authorities and developers to design and create successful, high quality, healthy and sustainable communities; they find themselves responsible for providing an appropriate design and high quality specification for the future homes, shaping our life and achieve high quality built environment.

Houses has a long life span, unlike other products such as cars or technology equipment with a short lifespan and easy replacement, for this reason developers should invest more in the design to extend the life span even more and achieve a sustainable environment and also tackle housing shortage. The average life span expectancy of a standard house specified by (BS 7543: 1992) is 60 years if maintained properly, and in the UK 39% of houses are over 65 years old. Table 3 shows that 21.4% of housing stock are pre 1919 and more than 50% is pre 1960s.

Table 3: Housing Stock Report (DCLG 2008)

As shown in Table 2, most of the volume house builders couldn't build enough houses to achieve the government's target to reduce housing shortage, and also couldn't provide the required quality to achieve peoples' needs and 21st Century life requirement (Holman 2013). Poor investment in the design quality resulted in that, the UK has some of the smallest and uncharacteristic housing in Europe (CCHPR 2013). Implication associated with house building process resulted in declining small companies and individuals from building their own houses; people are left with no choice and the only available option is renting or buying houses designed and built by mass developers.

Engaging communities and public view in the design process and decision making is one of the main challenges in developing the housing scheme, and it should be in a way, creating an inclusive and meaningful design process to bridge the gap between the developers and end-user and bring benefits for all the parties involved. However, there is no evidence or documentation to show that the government, planning authority, architects, designers and developers share public view while designing and developing housing scheme (Phibbs 2015).

However, we need to take account of the fact that people see the value in a good design and this will attract them to modern houses which include innovative thinking, integrated with existing communities and comply with the modern lifestyle (Ipsos MORI 2014). Dramatic changes in life style took place in the last 15 years, economic changes, technology, climate issue, demand for sustainable buildings, aesthetic requirement; at a point all these facts must affect planning authority, architects, designers and developers to rethink about produce a new model housing design response to these changes. House Price is set to rise for the next 50 years due to housing shortage and restrictions on the land availability (Davidson 2017), which means all the parties involve in housing developments should invest more in the design, build more durable houses last longer to tackle housing shortage and reduce housing price, provide larger spaces to accommodate younger generation who find difficulties to buy a house, avoid replicating house form design and produce a more modern models shaping future trends.

1.2. Previous Studies

House building statistics by the Department for Communities and local Government (DCLG) shows that the majority of British houses are replicated of post war houses, as Table 4 shows developers couldn't achieve the required target in the last 15 years and the gap of housing shortage in the UK is increasing. In recent years, since 2000, the role of Local Authority and Housing Association changed dramatically from developing public houses to public housing management role, which resulted in creating few numbers of mass developers took over the role and they became a major house provider in the UK.

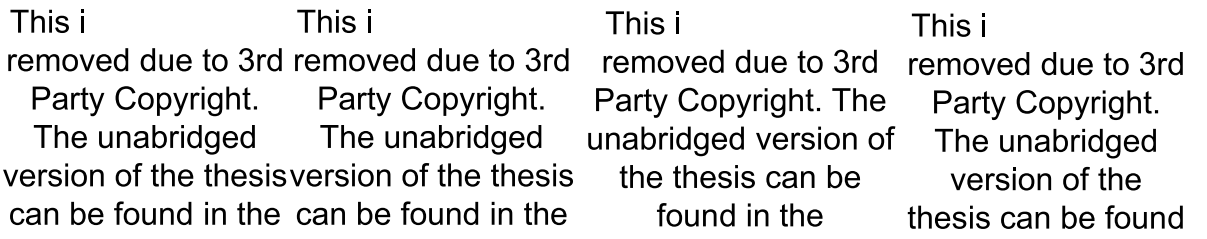
Table 4: Department for Communities and Local Government

Houses in the UK are mostly roman brick technology with plastic PVC windows, little storage spaces, small internal spaces or inadequate spaces and little to no sound insulation, surrounded by brown fences and little gardens built to comply with 21 meters back to back regulation, despite the fact that the regulation doesn't exist anymore (Stratton 2012). According to the RIBA Case for Space Report in 2010, only one in four people prefer to buy or move to a new built house, which means 75% prefer to live in an old house, having larger rooms, more storage spaces, drive way, larger garden and cheaper price, rather living in a new built house having small living spaces, small outside spaces, parking problem and lack of architectural character (Architecture 2010).

Considering modern lifestyle, people requirements and needs changed dramatically in the last 15 years. However, developers ignored these changes and couldn't embed these changes within the design process, continued reducing the size of new built houses and recycled old house designs for decades, which resulted in producing smaller old-style houses with a higher price, which made the people lost interest in the new build houses and prefer old houses as they are the same shape and style as new houses but coming in larger sizes and cheaper prices. Even though the style of design has not changed, there has been evidence of significant reduction in size and quality of construction that affects choices made by buyers.

Changes in lifestyle can be summarised as below: the three to six recycling bins which are not integrated within the design at an early stage are turning attractive residential streets into a mess. Householders have been left struggling with several wheelie bins or boxes for rubbish, recycling food waste and garden waste - which they may not have room for in their driveway or front garden or even back garden (Matharu 2014).

Figure 1: Eyesore: War on wheelie bins that litter our streets (Hall 2013).



Other changes such as the rise of the multi car householder were not taken into account when designing these houses, according to Esure car insurance report; nearly 1.6 million families in Britain have three cars or more (Esure 2013). The report shows that the UK growing number of multi-generational homes has led to a boom in car ownership. Lack of driveway and reasonable parking space is creating serious conflicts and disputes between neighbours sometime leading cause of death (Dunne, Dubuis & Pettitt 2014).

Reports from AA Home Emergency Response (HER) shows that 36% of problems between neighbours are occurring as a result of parking disputes and the report indicate to that 91% of peoples looking to buy or rent houses with an off street car park (AADL 2015).

Figure 2: The rise of the multi car family (Aviva Family Car Report 2012)

Many new built homes have garages, however inadequate width of the garages made it difficult to accommodate a car. A survey carried out by Door & Hardware Federation shows that 75% of new built home garages used as storage rooms not as a garage, as they are narrow and too small to fit today's larger cars (DHF 2013). There are also extreme examples of very small garages that cars will not fit a 2.44 meter width garage developed by Persimmon Home Developers, one of the UK leading house developers (Mcdermott 2013), another example is Aberdeen City Council rebuild new 200 small narrow garages which is difficult for cars to fit in (Ray P 2010).

Figure 3: £200,000 house came with a garage too narrow to park a normal car (Mcdermott 2013)

Developer's intention to build smaller houses to maximise unit output created overcrowded areas with houses facing different directions and neighbourhood lost character of tidiness and organised development, on the other hand the necessity of redesigning garden spaces in a way make a better use of it to accommodate the multi wheelie rubbish bins or parking at least one car.

The overcrowded housing development with small gardens created a noisy overlooking environment and potential disputes with neighbors, for these reasons not many occupants in the UK use or maintain their garden properly and many gardens turned to a tip (Slack J 2013). This was the main reason behind Theresa May's announcement during the Chief Police Officers annual conference in Manchester that, new Anti-Yob laws to issue a fine if a garden is not used properly. Householders who regularly dump rubbish in their own garden will be guilty of a criminal offence and receive on-the-spot fine of up to £100 or be taken to court – where the maximum fine would be £2,500. The new Community Protection Notice was the key point of the new anti-yob laws published by Theresa May (Slack J 2013).

Figure 4: £100 fine if your garden is a tip (Slack J 2013)

The new Anti-Yob laws related to appropriate use of the home gardens pushed Nottingham City Council to respond and issued 451 penalty fines to householders who regularly dump rubbish in their own garden (Gray R, Herrmann E 2010). Issuing new laws and regulations clearly indicate that gardens are not used as it supposed to be or, maybe it is not responding to modern life demand, maybe providing larger rooms and more storage space could function better. Developers should consider this issue seriously and think about redesigning new home gardens in a way fit the purpose.

Addressing all these problems associated with the new built houses highlights the necessity for a radical change and a deeper look at housing design in term of size and form design. Replicating old houses design made it difficult to adopt a modern life needs, for example, having a large screen TV, fitness devices, holiday equipment, multi cars and advanced technology become a modern lifestyle requirement, and the need to have a larger living and dining spaces so they can entertain their family and friends become necessary. In addition to missing all these requirements, lack of sound insulation and privacy from neighbor are another problem made new houses unfit for the purpose. It is important to revise all the problems and all the implications associated with new built houses, addressing each problem individually and embed the outcomes in new model designs at a very early stage and include peoples view and coordinate all the parties involved in the process.

All the problems discussed in this section can be named as modern life style changes and needs. Architect, Designers, Planning Authorities and housing developers should consider the changes has taken place in the last 15 years, and these changes are more about rational thinking and redesigning spaces and form without affecting the cost dramatically (Macmillan 1983).

1.3. Significance of study

It is important to highlight the key issues affecting the design of size and form of newly build houses in the last 15 years. Addressing those factors could help plan and provide solutions to build better houses in the future and stop developers from reducing the size of newly build houses, and also stopping them from recycling old design and encourage a more innovative design and construction to accommodate 21st Century life needs. "Decent Home Guidance" by the Department for Communities and Local Government expressed the value of good design and how good design matters to people, which can add to the health, social and economic value of housing.

According to DCLG guidance there are objectives and measurable criteria for good design which can be followed by all the parties involved in the development of new housing (GOV.UK 2006). The report by the Home Builders Federation express that the housing industry can and does produce a good quality housing, and there has been a real progress in recent years in term of thermal insulation, greener houses, better service equipment and technology (HBF 2015).

Figure 5: UK developers replicate 19th century terraced houses in a new development (Stock photos 2015)

West London 2015

Terraced housing in Bury 1900

Despite the radical changes in lifestyle and technology, Figure 5 shows the similarity of design and replication of old house design in a new development. This replication created similar look developments everywhere in the UK, as a result community started to lose identity (Kruczkowski S 2014).

Most developers recognise the value of good design quality and they are taking measures to achieve it, housing quality has been improved in term of complying with the national energy agenda and ease of maintenance, however, it is not getting better quickly enough in term of size and form design and an immediate major radical change should be made in the housing design to accommodate today and future needs. Design optimisation should comply with modern lifestyle requirements, as continuing building smaller houses recycling old house design will have a negative impact on health, wellbeing, economy, community and the future of construction industrial (Hughes 2011).

1.4. Research questions

In the UK very few people can afford to design and build their own houses due to financial and technical difficulties. Private developers and Housing Association are the main organisations building most of the houses, which means they choose the location, design, materials, internal layout, space dimensions and value, so they think for you, they dream for you and they shape your life. People are left with limited choice. However, the complexity of the process, land price and housing shortage affecting housing design negatively and limited developer's capability to invest more on the design process and research innovative ideas and methods to develop new model houses, continued recycling old house design and replicating same construction methods over the years has resulted in creating similar style of houses over many years. Modern Life demand changed dramatically in the last 15 years and the natural response is that everything should change to include house design to be able to accommodate these changes, so the questions remaining unanswered are:

1- Why UK houses are the SMALLEST, UNCHARACTERISTIC and most EXPENSIVE houses in Europe?
2- Why UK House Developers are still recycling old house design (designs from the19th Century and post-war housing design) for new housing developments?
3- What are the main factors affecting the design of new build houses?
4- How can UK housing design be optimise to meet current modern lifestyle needs?

1.5 Aim

The aim of this study is to 'investigate the factors that influences the current size and form of the newly built houses in the UK'

1.6. Objectives

1- To investigate the range of stakeholder views and perspectives on the design and quality of new generations of houses in the UK;
2- To investigate the key reasons that affect housing design in the UK;
3- To identify if meeting minimum Building Regulation and national energy agenda are the drive or target for designing new houses;
4- To evaluate the value of good design for house owners, designers and property investors;
5- To highlight the factors resulted in producing current house typology in the UK;

1.7. Research methodology and methods

This section is a short overview of the different approach of data collection, which has been used for this study and explains the rationale behind the chosen approach. Details of the research strategy and chosen methods will be explained later in Chapter Three. The aim of this research study is to address the necessity of optimisation of housing design, underline the reasons behind building small houses and replication of old house design. Due to the nature of this topic in term of the subjectivity and objectivity of the views and involvement of many party views starting with the government, planning authorities, developers, pressure groups, national and international agenda, agencies and ending with the end-users, the adopted methodology for this research will be pragmatic research approach to avoid any philosophical discourse about the effectiveness of the chosen approach and to overcome the limitation of single method (Naoum 2013).

Qualitative methodology is the main drive of this study, however Quantitative methodology adopted to test the internal reliability (Bolton 2014). The mixed methodology and the information collected from the literature review create a triangulation approach. The outcomes of this triangulation will be used to characterise the problems and potential solutions for optimising housing design in the UK. In addition to the information collected from the secondary data through accessing government's official statistics, planning authorities' data, estate agents and organisations, carefully selected case studies adopted to assess new design ideas and show the impact of good design on accommodating modern life style needs and requirements.

This research uses mixed methodology to gather the appropriate data required to understand the evolution of building form and layout. The use of mixed methodology is used to achieve triangulation of results and reduce the relative weakness of the individual research methodologies used separately (Fellow and Liu, 2005).

The qualitative methods adopted for this study includes semi structured interviews with architects and designers involved in the case study project design process to identify the main challenges behind housing development and highlight barriers preventing designers from innovation and change in building form and layout design. Visual image analysis method which uses images of the various case study projects as a tool to identify replication and recycle of old and existing designs for many decades, comparing new and old build houses form design. This method requires collecting brochure, drawings and access mass developer's website to address similarity in their design approach, visual analysis provides additional layer of information which writing method can't produce (Saunders, Lewis & Thornill 2007).

In addition to the Qualitative Methods use in the study, Quantitative Methods have been used, to test the internal reliability and restructure the many implications associated with housing design to a limited size and form of house design only. The questionnaire deployed to Estate agent has been modelled based on RIBA survey questionnaire. The purpose is to test the validity of the RIBA survey within the context of the size and form. RIBA Survey outcomes suggest that only 1 in 4 people prefer to rent or buy a new built house. The second reason is to frame the main factors causing people's loss of interest in a newly built house through measurable outcomes from the survey. Conducting a survey through preparing a well-structured questionnaire, aiming to capture different views and explore different areas not been covered within Qualitative methods. For this method, Estate Agents have been targeted to explore their view as an expert on the housing market and the active link between housing developers and end users and bring into view the feedbacks they have from different style housing occupies and also the impact of these problems on the market.

1.8. Scope and Limitation

The scope of this study focuses only on the houses built in the last 15 years, mostly since the year 2000, when Local Councils, Housing Association and individuals stopped building houses and few mass developer took over the housing construction industry in the UK.

The author's intention is to cover two aspects of the design: Size and Form. Considering House Size in this research can be defined as the overall size of the house which will impact on the internal and external spaces, regardless the individual dimensions of the rooms or shape and practicality of space usage. The second aspect is House Form, which can be defined as the general appearance and look of the house without reference to the similarity of materials, colour or detailing.

To give it a wider context, five different areas in the UK selected for data collection, starting with midland (Coventry, Birmingham and Leicester), and including London and Croydon as well. It could give it a wider context if samples and data collected from North England, Scotland, wales and Northern Ireland, however time and financial limitation to travel was unavoidable.

Interviews have been arranged with members from design team working for Private Housing Developers, Housing Association, Architectural Firms, Local Councils and Planning Authorities. However, accessing statistics and data from Housing Associations and Local Councils could be difficult due to confidentiality of their data and strict data protection policy. Collecting data from Estate Agents considered to be necessary as well for this study as they are the active link between House Developers and End Users, and responsible for marketing these hoses and obtaining feedback from end users.

In-depth research into public view and the relationship between small spaces and negative health impact has been avoided and excluded from this study, which are very important areas and should be explored in future research.

Chapter 2 Literature Reviews (Housing Size and spaces)

2.1. Introduction

The aim of the literature review chapter is to establish the importance of the research and justifying the reasons for this study, outlining gap of knowledge through looking at the issue from a different perspective and understand opposing point of view. Analysing collected information could lead to identify areas where new ideas and contribution could be achieved (Maxwell 1996). The outcome is to be used for evaluating different methodology approaches and help choosing the appropriate methods to achieve the research goals and provide adequate answers to the research questions. This chapter includes a mix of case studies, journal articles, books, website articles and transcript TV Series identifying and exploring the implications lay behind housing design, from both quantitative and qualitative perspective, outlining factors driving dwelling size and form design, providing solid evidence to show how the absence of national minimum space standard and the strictness of green belt policy impacted negatively on new housing design, (Miller & Crabtree 1992).Literature review coming under two chapters, Chapter 2 and Chapter 3.

Chapter 2 is looking at government's policy, regulation and national standards identify the reasons lay behind reducing the size of newly built houses where there are no universal regulations governing housing spaces (Gallent, N., Madeddu, M. and Mace, A., 2010). Chapter 3 is investigating form design of new built houses and underlines the reasons that lay behind replicating and recycling old house form design for decades. Case studies such as Oxley Woods's development (section 3.1) and Micro-Homes (section 2.3) have been introduced as new design approaches to adapt contemporary living and reflect modern life needs and highlight the pros and cons of innovative design explaining why these modern approaches have not been followed by other developers. and also an overview of the Government and Planning Authority's role to push housing developers to provide better quality houses through updating Building Regulation and Planning Policy (Ipsos MORI and RIBA survey 2013).

It is essential to understand the steps taken by the Government, Planning Authorities and Housing Developers involving public view in the design process, also investigating barriers and implications restrict their ability to change and discourage them from moving forward to produce a more effective design solution matches modern life needs. The UK Government set the target for housing development to accommodate the growth of population and meet today's requirement. Population growth is the crucial factor lay behind housing expansion; one study model shows that 72% of household projection from 2008 - 2033 is coming from population growth (Populationmater 2013). Replicating old house design and decreasing the house area by developers to maintain the unit value, meet market demand and the density required by planning authority, as stated by RIBA, were the reasons behind the public loss of interest to live in a new build houses and preferred old houses in a more established area (Architecture 2011).

A survey done by RIBA and HOMEMOVE shows that new houses couldn't satisfy people needs due to a lack of many aspects such as: large rooms, large outdoor spaces, natural light, parking space, storage spaces, sound insulation, adaptability, flexibility, neighbours privacy, higher density and quality as people are expecting defects when they move to a new build house (Homemove 2015). According to the research done by Liverpool Victoria Home Insurance (LV) one in ten of the new built homes were suffering from contamination problems, flood, sewage and drainage as a result of being built on a brown filed sites (LV 2011). All these issues affected the value of a new built house negatively and developers started to face marketing difficulties which forced them to use marketing tools and attractive offers such as a Head Start Scheme offer by Barratt, Stamp Duty Paid offer, Shared Ownership Scheme or making the monthly payment seems cheap by offering a 35 year payback rather than 25 years (Independent 2011). These offers only available for purchasing new build house only not an old house despite the fact that the market suffer housing shortage which means high market demand and house selling should be easy without using marketing tools, survey shows that only one in four buyers consider buying a house built in the last 15 years and new houses take longer to sell (RIBA 201).

Replicating post war or 19th Century housing design which designed for a different purpose and different requirements will not be suitable and doesn't work in a high density area due to changes in lifestyles needs (Deigning Buildings Wiki 2017), for example: housing envelope technology improved energy requirements so there is no need for having small rooms to control heat. Due to economic pressure and rise in house price both younger and older generation depend more on family home to accommodate multiple occupation, increase the age of first time buyer push younger generation to stay longer in parent's home, the need for storage spaces to store sport and travel equipment, open plan design for socialising, a place to work from home, extra space for multi recycling bins and multi car parking demand, acoustic requirement, garden use, maintenance cost, disabled and elderly people needs, aesthetic and trend requirement, All the problems identified and highlighted indicate to the necessity of optimising the design of new housing in term of size, space functionality and form design.

Other available methods such as accessing Government and Local Authority's data to frame their requirements and investigate if the quantity compromised quality of new houses also investigate any kind of public involvement in the design process could give the study a wider context.

2.2. Government policies & Regulations

This section focuses on the legislation and policies related to housing space design and the role of the Government and planning Authorities to provide an adequate space regulation which private and public housing sector follow to establish a sustainable housing development and secure economic growth in a way to satisfy all the parties involved in the process. Highlight the zones which have been neglected and resulted in producing small houses and small rooms which may represent the key factors affecting housing space design, supported by case studies show plans for building smaller homes in the future. This literature may be used as an advantage to investigate if end user's views have been incorporated in the process of housing design and related housing space regulations and if there are any kind of coordination between housing developers and the public.

2.2.1. Housing Space Standard

As a part of London plan review, a research has been empowered and commissioned by Greater London Authority and Housing Association Training & Consultancy (HATC), which is one of the oldest established and well-known companies specialised in providing affordable housing consultancy in the UK (Mayor of London 2006). The research reflects the importance of having national minimum space standard after growing awareness and obtaining evidence about new housing developments built in the last 15 years having smaller internal spaces compared with older houses and continue reducing size of the houses which have many implications and negative impact on health, sustainability, accessibility and life quality (HATC Ltd 2006). The aim of the Greater London Authority research is to have a clear understanding of the philosophy and the objective lay behind both building regulation and planning policy system to find the right way of embedding national minimum space standard without compromising the design or the number of unit output. To prepare a report on space standard for this study they have used the knowledge and experience of the HATC project team, which they gained from developing properties in both private and affordable sector, and the second mechanism is using sources as Lifetime Homes, Wheelchair provision and BRE Housing Design Handbook as a guide to set up a data calculating the minimum space requirement for each room (BRE, 2013).

The research concluded that there is need for having national minimum space standard and the opportunity to embed the space standard within the codes for Sustainable Homes which helps bridging planning with building regulation together (HATC Ltd Report 2006), because in the last 15 years the government focused more on the quantity of supplied units to cover the housing shortage but not the quality.

Housing Standard Review report 2006, highlighted most of the complex factors drives dwelling internal space standards in the UK, based on the basic internal functionality and international space standard comparison, demonstrating how reducing the house internal space could benefit the developer making more profit but at the same time has a negative impact on the housing market and occupant satisfaction (independent 2011). The study suggests ideas and mechanisms to set dwelling space standard to help improve UK housing design in a way to raise occupant satisfaction (Drury, Watson and Broomfield, 2006). Another study by the Centre for Regional Economics and Social Research shows that the developers increased profit through increasing the housing production rate and housing size reduction of new built houses as building smaller houses means increasing the number of houses on the same plot of land and increase their profit (Archer, Cle 2016).

The premise of this study by Greater London Authority on Housing Space Standard is that UK housing design optimisation requires the government to provide a national minimum space standard or design guidance for the new dwelling developments, considering modern life style changes, future generation requirements, today's occupants need and involving new Equality Acts requirements in the new developments. The paper's concern is that, one in four occupants in the UK prefer to live in an old traditional style, low rise housing, larger rooms and more storage rather living in a new built house which have small living areas and inadequate small bedrooms with no reasonable storage spaces, lack of outer spaces, car parks and lack of light (Joseph Rowntree Foundation 2012). Everyone prefer to have a new product (common sense) but only 1 in 4 UK residences would like to buy or choose to live in a new house built in the last 15 years, the result of this research is a very strong message and an indication or an evidence to announce that, there is something wrong with the new built houses and an immediate action required (Home Wise, 2013).

There are no specific standard or clear guidance to set minimum space standard for dwelling internal spaces, as a result, developers reduce the internal space and apply minimum government and local authority's requirements to cut their cost, increase profit and make more out of their business, focusing more on producing higher number of units rather than higher quality houses (Drury, Watson and Broomfield 2006).

Housing condition is an important social determinant of health. Insufficient housing design could impact occupant's health directly including mental problems (Thompson, C 2017). However, reducing internal space will have a negative impact on occupant's comfort and satisfaction as well as creates implications for the life quality including health issues, accessibility and sustainability (HHSRS 2014). Experts and psychologist gave warning that lack of light and space in the new build homes will result in having marital problem and affecting children performance in school stopping them from reaching their maximum capability (4children 2014).

RIBA carried out a survey which shows that the new built homes are half of the size of the houses built in 1920s (RIBA 2013), and researches by The National Housing Federation shows that the case of space and good housing design could save NHS more than 600 million pound a year and improve resident's health (Jake 2014).

Figure 6: New Homes vs. Older Homes (RIBA 2013)

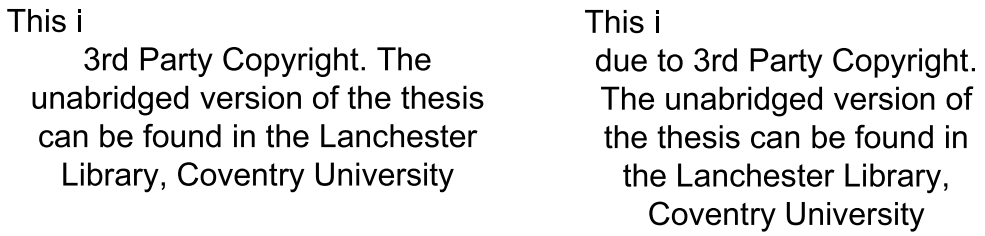


Figure 6 shows a row of semi-detached three bedroom houses built in 2012 in Wiltshire, nearly half the size of the houses built in the 1920s Petts Wood, southeast London. According to the research carried out by the Institution of British Architects the average house area in 1920 was nearly 500 m2 having four bedrooms, but new built equivalent has a three bedroom and an area of 280 m2 (Robinson 2013).

Figure 7: New Homes vs. Older Homes (RIBA 2013)

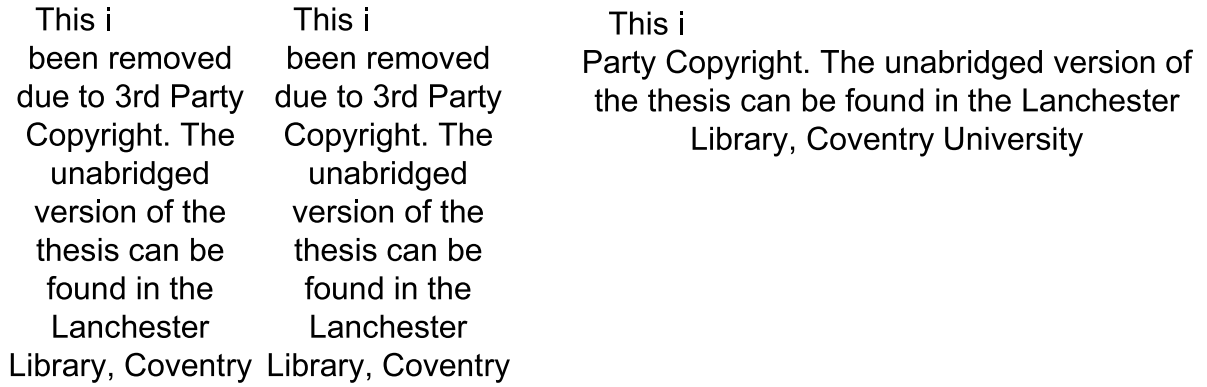


Figure 7 shows the contrast in plans, rooms were longer, wider and had bay windows, with much more storage as well. A RIBA survey in 2013, shows that new houses are unpopular, and negative issues, because of reducing internal space such as lack of light, reducing circulation area, not enough space for family socialising or for children to play, difficulties to fit furniture and out of step with international trends and new environmental requirements (RIBA, 2013).

On the other hand, reduced space creates cramped living spaces and reduce natural lighting due to small size windows and long, narrow space design which impacts negatively on children's performance, family relationship and occupant health (HHSRS, 2014), lack of natural light lead to premature aging, diabetes and diminished immune system (RIBA 2013).

Home wise report shows that if builders are left to achieve minimum building regulation, we may find future houses with only a small box with 1 window of 45cm x 45cm per room (Planning Portal, 2013), which means optimising housing design become necessary and require coordination of all the parties involved in the design, plan and regulation process. A space SHOULD NOT be named as a 'bedroom' unless it has 600mm of circulation area around three edges of the bed (DCLG, 2013), plus fitting in bedside table, chest of drawers, wardrobe, and desk minimum. Another survey in 2004 showed that the size of bedrooms were reduced in a way only 59% of the new built three bedrooms homes had a space for four beds, which means that only one bedroom out of the three bedroom counted as a double bedroom (Joseph Rowntree Foundation Study, 2004).

Houses are named according to the number of the bedrooms without looking at the size and quality of the bedrooms. Study by the Commission for Architecture and the Built Environment (CABE, 2009) shows that, house holders with lower income can't afford to buy or rent larger homes and they have to live in a more affordable small houses which lack privacy, light and spaces.

However, through optimising the design and having national minimum space standard, adequate space and natural light can be achieved. According to the study carried out by (RIBA, 2011), UK new homes are smaller by 21% compared with Japan, looking at the data provided by (IndexMundi 2015) which is a data portal for statistics and facts, shows that Japan has more population growth and less land to build on (Worldbank 2014). The cost of a standard house construction in the UK is higher by 46% compare it with Germany, yet in Germany brick cost is higher by 25% and cost of bricklayers is higher by 20%, which means we pay more to buy a smaller and lower quality house when the material and construction cost are cheaper than other countries in Europe (Townsend N. 2012).

Table 5: Average new UK three bedroom houses is only 76 square meters (Gentoo Group 2006)

Table 5 shows that new built homes in the UK have smallest floor spaces (76 m²) and smallest room sizes (15.8 m²) compared to other EU countries; looking at the data (ALL DWELLINGS), UK coming near the top ranked 4th on the table after adding old houses, which means adding old houses impacted on the floor space calculation dramatically since space reduction started for the new built houses in the last 15 years. The rational justification behind floor space and rooms size reduction for new built homes in the UK is reducing energy consumption. However, data shows that Germany reduced their energy consumption by nearly 25% in the last 15 years (Redefine International 2016); this means that building larger houses doesn't necessarily mean more energy consumption.

Table 6: Energy consumption Germany vs UK

Despite the fact that houses in Germany are larger in term of floor spaces and room size, Table 5 shows that total energy consumption in Germany is lower than the UK. If the house shells well detailed and properly insulated, enlarging size will not increase energy consumption dramatically, so a national minimum space standard is required and necessary to prevent building smaller houses. UK is the only country in Europe that doesn't have minimum space standard policy (National Archives 2015), and this is desperately needed to have national space standard to prevent building smaller houses in the future. UK homes can be improved through providing national minimum space standard to build larger homes, more flexible and adaptable design, and in term of achieving energy and sustainability agenda, increasing the internal spaces will not affect energy consumption if builders focus more on construction quality and invest more on improving design quality (Drury, Watson & Broomfield, 2006). Improving outer shell insulation, integrating more advanced technology, working harder on detailing to prevent heat loss and eliminate thermal bridging will enable UK developers to produce larger houses and more economic energy performance. This step require setting a minimum space standard for dwellings in the UK to prevent building small houses and provide high standard housing for the next generation.

However setting national minimum space standard without optimising the traditional design will not be functional and difficult to accommodate modern lifestyle requirements (Drury, Watson and Broomfield, 2006). The key recommendation is that, the government and planning authorities are required to create and set guidance for minimum space standard to prevent supplying more of small which impact negatively on the quality and sustainability future of housing.

2.2.2. Government consultation on Housing Standards

A consultation has been issued by the Department for Communities and Local Government to review local housing standard and provide a radical change to the framework of building regulations, building guidance, codes and planning system technical standards, aiming to support housing sector growth through reducing time required for planning approval, paper work and reduce planning cost on developers without compromising the design and keep improving quality, sustainability, safety and plan for having better accessible homes (Cooper 2013). The consultation paper has been launched recently by the Government to simplify many developed regulations and guidelines locally and nationally. Increasing the number of these guidelines and regulation some time overlapping or contradict one another creating complexity which impact negatively on the design quality (Schneider & Till, 2007). Housing Standard codes and information are spread over many areas of regulations and guideline resources and it is very difficult to assemble.

The government consultation paper aims to rearrange all the guidelines in a simple national housing standard document which can be accessed by any one any time, the proposed new standard suggested to include space standard as a key requirement, accessibility, security, water efficiency, energy, indoor environment, materials and process.

The report from RIBA survey on 2013 stated that there was a very strong support by the public to produce a minimum housing standard including space and energy standards in a simple format which would affect their choice positively when they make their decision to buy or rent a home (Cooper, 2013). The study by the Government consultation on Housing Standards suggested that the Planning Authorities needs to provide a new "Nationally Described Housing Standard" which can be accessed and used by anyone to prevent reducing housing internal spaces anymore, using a simple format which sourced from many existing local or national guidelines and regulation standards, includes minimum space standard and design standards also cover other new regulations related to the environment and energy saving (DCLG 2013).

The Government is ready and keen to work on the new "Nationally Described Housing Standard" as the rational and benefit behind this exercise is clear and will help stop housing internal spaces from getting smaller and reduce complexity of planning approval saving developers time and cost. The suggested solution by DCLG Consultation Paper was, it could be either embedding new housing standards in the Building Regulation or develop a short and simple national space standard document individually (Cooper, 2013). The consultation paper on housing standard by the government suggested that, space labelling scheme on housing could be another solution to help compare the size of internal spaces in a new build homes with the benchmark suggested by the proposed national minimum space standard, this comparison by the client could influence and push developers to build homes with larger internal spaces. There are different opinions about Housing Standard mechanism and it is very important to apply any new space standards to all the houses: private sector or social housing sector (Cooper M 2013). However the government paper prefer the voluntary approach such as labelling the spaces as a part of the new standard scheme on the new homes rather than mandatory space standard which may impact on the units output negatively.

2.3. Small houses in Britain

Considering the history of UK housing styles, small houses have become popular since 18th Century to provide a high-density housing development for working class families, as towns and cities were built around factories after the industrial revolution (David 2008). They were originally built responding to desire for low cost and low rent properties to accommodate people working in a close distance to their workplace due to lack of transportation, using local materials. This style included terraced houses, narrow and deep called two-up two-down house style (Peter 2013). The necessity of designing small rooms were for structural requirements, economic reasons due to availability of timber in shorter lengths and lack of insulation and heating requirement. Other reasons such as increasing migration from villages to cities in mid-19th Century was behind replicating this style and it became a solution to accommodate large number of people in a constricted area.

After the Second World War again this style became popular due to the necessity of providing a high number of houses destroyed by the war and to replace the slum developed during the war (Thom 2003). Even though this style of small houses created an overcrowded unsustainable area, lacking natural light, privacy and occupants suffered many health issues but it has been replicated through decades either as a temporary solution or as a response to a certain emergency or disaster (HHSRS 2014).

RIBA carried out a survey which shows that the new built homes are half of the size of the houses built in 1920s (RIBA 2013), and researches by The National Housing Federation shows that the case of space and good housing design could save NHS more than 600 million pound a year and improve resident's health (Jake 2014).

Figure 8: 19th Century and post war houses (Gianfrate, Piccardo, Longo, and Giachetta 2017)

Considering downsize the living space and moving to a newly build smaller house could have advantages as well, such as, having structure warranty for many years, more energy efficient home, which means lower utility bills to be paid and greener environment also having combined heating and power systems can save natural resources. Buying off plan could give you the ability to select types of fixture and finishes, smaller gardens cheaper to maintain, easier to purchase having government's Help to Buy scheme (CABE 2005). Looking at the bright side, constructing small houses means creating a high density development which also can deliver benefits to the community, such as, best use of land, protecting rural areas, improving services and producing a neighbourhood with different design, and on the other hand, high density development can bring social benefits and create a vibrant neighbourhoods, supporting transport, local businesses, shops and provide private and shared outdoor spaces. Other advantages are creating a safer community and safer streets due to overlooking by many homes, crowded street and more people to walk and cycle gives a safer community feeling which encourage children to play outside or walk to school (CABE 2005). Developers achieving high density without compromising quality and 21 Century life demand through building three storey houses instead of traditional two story, building terraced housing rather than detached houses, small apartments for households with no children.

A research by The Royal Institute of British Architects (RIBA) looked at the size of newly built homes in the last 15 years and results show the necessity of having minimum space standard regulation to be embedded within the building regulation for new build homes as a response to the importance of light, space and fresh air to achieve the sustainability requirement which is crucial for the occupant's health and wellbeing (RIBA 2013).

Lack of space standard regulation resulted in reducing the internal spaces of new build houses, and building smaller houses missing the key aspects of quality such as: privacy relaxation space, natural lighting, storage rooms and reasonable outdoors space. As a result of the survey done by RIBA 75% of the peoples don't want to buy new built houses due to small size rooms as a key factor for their decision. On the other hand another research by the Centre for Sustainable Development in Cambridge University shows that new homes has been built in the last 15 years are smaller by 15 - 80% when compare it with other European countries (Morgan M & Cruickshank H 2014).

The issue of housing crisis facing the country was another reason behind producing small poor quality houses suffering lack of space, natural light, privacy and character, justified by achieving the quantity to tackle housing shortage. Another report by the Greater London Authority at 2016 looked at the potential for building smaller houses to increase supply of new homes and improve affordability, as building smaller houses means less materials, land and construction time, which results in cost savings, and on the other hand producing more unit output on the same amount of land (Harrison 2016). All these reasons stated previously will lead to provide cramped neighborhood lacking space, lacking architecture identity, and natural light and as a result these issues impact negatively on occupant's health and their life style (RIBA, 2013). Reducing housing space and window sizes can be resolved through developing a national space standard regulation by the government based on the average European space standard, occupant's health and today life needs. The space is a necessary aspect of house quality and cannot be counted as a luxury; on the other hand natural light is essential not only for saving energy also for health and mental wellbeing (RIBA, 2013).

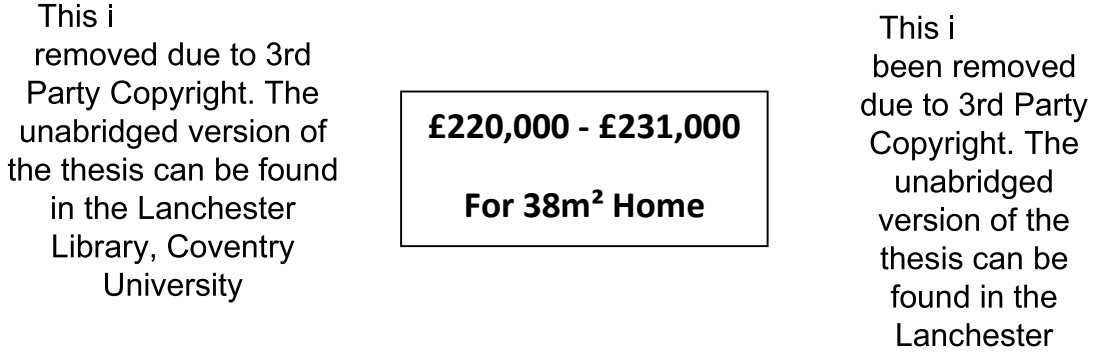
RIBA camping assessed the value of space standard to provide a high quality homes based on the basic requirements for occupants health and satisfaction. Building more cramped developments with smaller spaces and minimum natural light to achieve the density required by planning authority will have a very negative impact on occupant's health, security and life style (RIBA 2013). Lands high prices is another area to look at which affected developers and pushed them to provide higher density homes per hectare to gain their target profit and achieve the quantity required by the government and planning authority. Pushing developers to build larger hoses with having larger spaces and windows can be controlled and framed through planning and building regulation, however it may impact negatively on the housing production and unit output which again affect the sustainability of future generation (RIBA 2013).

Developing space standard regulation is necessary and a key action to avoid building small houses, but before taking this step we need to make developers believe in the negative impact of building small houses on the people health, wellbeing, on the market and on the whole construction industry future. RIBA's paper highlighted the negative impact of lacking space standard regulation on the UK new housing developments, however complexity of planning approval in term of time and cost and other difficulties facing developers while purchasing land in term of cost and complexity of building within the green belt, are other issues to consider, otherwise national minimum space standard will be a part of the complete solution.

2.4. Case Study: Design optimisation through building Micro-homes; is it a solution or increase the housing problems?

Pocket developer started to develop a new £40 million project to deliver a mixed of 100 affordable housing and offices in west London for middle income byres (Brenton H. 2015). These houses will be sold to the local market with a minimum discount of 20%. This project is Pocket's fourth development of this kind to develop Affordable Pocket Homes, providing a high quality 38m² one bedroom homes with floor to ceiling large windows to provide maximum natural light and underfloor heating system to save space and avoid bulky radiators located in a good community location within the city.

Figure 9: Affordable Pocket Homes 38m² one bedroom homes (Pocket Developers 2015)



With continuous UK housing shortage problem, land prices and house price moving up constantly, building smaller traditional style houses become a trend today. Is building micro or pocket homes with optimised design and use of advanced technology could be the answer and an easy way to solve the problem of UK housing in term of lacking adequate spaces and form. This was the question that Richard W. from Architects' Journal asked some of the experts who leads the housing sector in the UK (Waite R. 2015).

The conclusion of the answers was, this project may help and solve a part of the problems for the temporary workforce, student and people who stay over for a short time who added pressure on the housing shortage and housing price, however this will create more problems, especially in the cities, as building smaller houses will lead to increase densities which means increase the land price and result in insane purchases and as a reaction it will encourage increasing the price of everything else (Park J. 2014).

The competition of building pocket houses to tackle housing shortage, satisfy occupants, provide quality design and achieve modern life style requirements is proficient and encouraging, however it is a worrying step to unsecured consequences, as some of the master bedrooms with no windows or choosing between having a bath or wardrobe will create unhealthy environment and negative impact on the whole community (Brenton H. 2015).

The Micro-Home or pocket housing project may comply with the building regulation requirements and could achieve the code of sustainability, but it will create other problems such as lack of natural light due to having bedrooms with no windows or installing 45x45 cm windows which still comply with Building Regulation, other problems such as lack of view, lack of circulation area & accessibility difficulties and health problems. On the other hand space reduction may affect the standard size of beds and furniture, creating smaller size beds to allow for storage (Lewis S. 2015). Pocket homes organisation is a very well-known company, always achieved high quality and very innovative in their thinking. Pocket home project tried to show that optimising design could be the solution and sort out the problem of adequate spacing, form and layout. However if the Micro Homes become a common model and obtained by the wrong hands, housing will be in a serious problem, difficult to fix and will create new complexities for housing sector and economy.

It is important to keep the quality of lifestyle and having the journey from the road to the house front door then to the living space and having a view and natural light is an important part of our life style and shouldn't be compromised (Waite R 2015). The project of pocket homes is a very good step to overcome the problems for particular housing circumstances and target a particular market sector, BUT if they are designed properly by well-known companies in term of quality and managed properly. For example, targeting young generation to get on to the housing ladder, provide living space for workers and students to stay over and reduce the pressure on the standard housing stock. However, this model shouldn't become a unique modern life style model to be replicated everywhere in the UK and replace the future houses we aim to improve (Bradsky A. 2015). This is one of the main aims of this research to prove the necessity of having national minimum space standard within the frame of Building Regulation or Planning Policy to avoid spreading of this type of project and preventing developers from building smaller houses under the justification of housing shortage.

Space standard is regulated by the planning authorities and can be challenged through making a case and providing reasonable reasons to trespass the border of national space standard and if this is become a popular approach we will face serious problems in the future which can't be tackled easily.

As discussed by Bowles M. (Director of Mole Architects), Housing Design Handbook explained clearly the negative impact of reducing living spaces on the health and community; and also the cost of smallest Micro-Homes is five times more than the combination of two people's average wage. Micro-Homes can be described as a smart temporary response for a failed system, but not as an actual intelligent solution for housing crises (Bowles M. 2015). Pocket started developing a one bedroom homes which is only 37m² as a solution to provide affordable houses for those looking for downsizing their homes. Other local authorities has asked for this type of homes and according to the UK national survey there are 750,000 people only in London looking for this type of homes to buy or rent, which appear to be a solution for housing crises, but nonetheless associated with many problems in the future (Vlesing M. Pocket chief executive 2015).

To conclude, Micro-Home is a desperate weak response of the time and the reflection of a failed housing system which couldn't deliver the required number and quality of houses to the public. Micro-Home can't be counted as an adequate solution to tackle housing crises in the UK and will lead to create more problems such as increase in land price which reflects on increasing the price of property and everything else, and according to the (The Housing Design Handbook 2010) increasing density result in conflicts, creating unhealthy environment and unsustainable context. The suggested and recommended solution will be revising the whole housing system, avoid historical mistakes, incorporate National Space Standard within Building Regulation frame and working together finding solutions to provide affordable and decent homes comply with modern life style and achieve sustainability goals.

2.5. New built homes and the case of spaces and resident view

A joint research by CABE and English Partnership with RIBA investigated resident's view about the size and functionality of spaces in their new built homes, using questioner to collect information from 11,500 home occupiers living in new homes which have been built since the year 2000 (CABE 2009). This research aimed to assess whether occupants are satisfied and comfortable with the size, functionality and the daily use of these spaces, and whether these spaces comply with modern lifestyle requirement. The research is assessing the basic adequate space requirement for cooking, eating, relaxing, storage spaces and socialising and due to the long life span of houses, they should offer a good size flexible and adaptable spaces to accommodate future family expansion, enough space for children, and flexible spaces for older and disabled people.

Between the 1960s and 1980s mandatory national space standard called Homes for Today and Tomorrow was set by Parker Morris, this standard included dimensions for circulation, activity and furniture arrangements (HATC 2008). The report specified a 76.5 m^2 gross internal floor area for an average family of four, storage spaces excluded.

Table 7: Homes for Today and Tomorrow (Morris P 1961)

This document can be considered as a benchmark for national minimum space standard in the UK and had a dynamic thinking about having larger size houses and include an extra space could make the design durable and a future investment for family expansion. The report concluded that flexible and adaptable house design become a national need. This standard was to be used only for social housing and it's never been mandatory for private development, No drawings or room dimensions have been published deliberately to avoid limiting creativity of the designers.

The Parker Morris Guide specified in general that every house needs a direct entrance to the kitchen, a separate living space from dining space, children of the opposite sex must have a separate bedroom, storage space for a pram and folded wheelchair and a ground floor toilet. This report was a reflection of the lifestyle change and supported design optimisation to accommodate modern life needs (Morris P 1961). However the Parker Morris standard withdrawn from UK building regulation on 1980 and never been replaced with a new standard. Since then no national minimum standard exist in the UK regulation or planning system, which mean no specification for floor space like in other European countries, and that is why UK has the smallest new built houses compare it with EU countries, and it is at the bottom of the table in term of floor area and room sizes (RIBA 2013).

This issue pushed CABE to research and ask the residents if their new homes have adequate spaces which fit for the purpose. After analysing the questioners finding can be summarised as that 94% of occupants said that, the property size and space areas was the most important and the main drive behind their choice and decision of where to live, but they couldn't find enough adequate spaces to be used comfortably(CABE 2009).

This answer reflects that a new built home doesn't provide adequate space for living, either it is too small or not functional. Another finding was that an extra spare bedroom doesn't mean an extra useable space or adequate living space; it is about the size of other spaces to be flexible, adaptable and useable. The case of inadequate space in the new built homes affect whoever can't afford to buy or rent a larger house and they are the people on lower incomes who mostly affected by the negative impact of inadequate spaces.

The research by CABE suggested that not having inadequate size spaces means that these houses are not adaptable and they are difficult to response to occupants needs in the future which changes over the time such as family expansion, having disabilities or elderly issue. All this can be translated as unsustainable development. The government recognise the value of adaptable housing and sustainable development, and set standards of lifetime homes and sustainable housing codes to achieve the sustainability target, however new built houses can't afford flexibility and adaptability (CLG 2011). Other outcome from CABE research was about the limitation of space for furniture movement and furniture sizes, as 58% of the occupants responded that they don't have enough space for their furniture or difficult to relocated the furniture due to small size space, small corridors and staircases.

Other issues such as small kitchens, lack of storage and lack of space for family socialising has been highlighted. The conclusion of CABE research was supporting the case of larger homes and adequate spaces, and the need of having national minimum space standard to insure a sustainable future for the next generation.

2.6. Benefit of having space standards

University College of London conducted a study in 2010 to address and specify the benefits of having national minimum space standard for new build homes using evidence from history and current housing developments (Camona M, Gallent N and Sarkar R 2010). Historical evidence shows that UK government and planning authorities never looked at national minimum space standard seriously. Lessons from the history shows that always there been a demand and need for having space standard especially after the industrial revolution in the UK resulted in rapid population growth in the cities and urgent demand for building many small and poor quality houses to accommodate working class householders, which created overcrowded neighbourhood leading to unhealthy environment and the consequence was rapid disease spared (UCL 2010).

Low rents generate low investment and production of small and poor quality houses. For the very first time in 1919 the case of having space standard was raised. Historical evidence proved the necessity of applying space standard and improving housing quality, which later became a requirement by the councils for social housing program (Carmona M 2001), however this regulation never been considered seriously with private developers or develop a new space standard and expand it to include all public and private sector which was the main factor behind UK having smallest houses in Europe today. The Parker Morris space standard which was the only space standard and was designed only for social housing has been withdrawn from UK regulation in 1980 (Drury A 2008) and since then reduction in size of new built homes and internal spaces can be seen clearly.

Review historical evidence and research's addressed the key benefits of having adequate spaces which can be controlled through setting national minimum space standard and embed it within Building Regulation, benefits of having adequate spaces can be summarised as below:

1- Improving health and wellbeing when having a decent space for daily activity and sociability (HHSRS 2014).
2- Adequate space for studying without interruption increase children's potential and learning ability (Cassen R and Kingdon G 2007).
3- Provide adequate space to be used for working from home which means improve sustainability (Gibson X 2003).
4- Having homes with adequate spaces means it is flexible to accommodate lifestyle changes and adaptable for future changes such as family expansion, disability and old age requirements.
5- Adequate home size means avoiding overcrowded neighbourhood and reducing conflict and antisocial behaviour (DfES 2007).
6- Create a stable market for housing and look at long term investment rather than short term investment.

This UCL research addressed the benefit of having national minimum space standard and didn't distinguished between private or public sector, the standards should be applied on both private and affordable housing developments as benefits are the same for both sector. The paper suggested that adapting one of the existing national minimum space standards from other Europeans countries could be the first step toward setting a new UK style space standard and make it suitable for our housing sector and public needs (Gallent, N., Madeddu, M. and Mace, A. 2010).

2.7. Flexible Housing

Flexible Housing means houses which can adapt future changes and space patterns changes so occupants can live in the house for a longer period through adjusting of the spaces to accommodate their personal need. Future changes could be on personal level such as (family expansion), change in circumstances (having old or disabled people), technology level (which as updating or changing old services), demographic change (which is increase in single household), economic changes (staying in parent's home for a longer period due to the house price increase), environmental changes such as updating the houses as a response to the climate change and reducing carbon footprint (Schneider & Till 2007). The book which is written by Schneider & Till is demonstrating the importance of designing flexible housing which results in having longer life span and leads to sustainable growth of housing sector and build greener environment.

For this study 160 examples from all over the world chosen carefully to show the positive impact of flexible housing design, focusing on three life example developments in the UK as a case studies to show the importance of adequate space design in term of size, functionality and layout to avoid redundancy of many houses just because of its inadequate space size and design, on the other hand showing the effect of flexible space design to accommodate life style changes or change of household circumstance. New housing survey by CABE'S National Housing Audit shows that 13% of new built homes design can be considered as good space design and 82% as poor space design in term of size and layout (RIBA 2006). Kelvin flats in Sheffield resulted in demolishing the whole development just after thirty years of the project completion and replaced by eight storeys tower student accommodation. However half of the new student accommodation tower left empty for a long time and the buildings couldn't be adapted to accommodate change of use or modern lifestyle changes because of inflexibility of design (Schneider & Till 2007), so the decision has been made to be demolished after 30 years of it is life. Another semidetached housing development in the same area has been demolished because they were unable to build any extension or make any alteration or changes to it, again because of the inflexibility of the design. All this demolition which cost money and have negative impact on the environment could be avoided through adequate design of space and more flexible layout design for a longer life span (Schneider & Till 2007).

People lifestyle requirement, technology and change in occupants circumstances are in a constant change. Designing flexible housing spaces and layout to accommodate lifestyle changes could be the response for future housing developments. Many buildings in the UK get to redundancy at a very early stage of its life due to design inadequate spaces, providing load bearing internal walls, pitched roofs filled with timber trusses and no space for extensions.

To have flexible adaptable housing distinguishing between the technical terms “adaptable” and “flexible” design is necessary; they are two different way of design, including both techniques are necessary to improve the future of housing in the UK (Schneider & Till 2007). Adaptable as defined by Dutch architects is a short term solution, when you move in to a new house and adapt the spaces according to your needs without making any actual physical alteration. Flexible design is planning for a longer life use when you need to change the internal layout through moving a wall or providing an extension within a reasonable budget so physical and structural alteration involved. Combination of adaptable and flexible design technique will impact positively on occupant’s social life, housing market and environment (Westminster Research 2005).

According to the research done by University of Westminster flexible housing is the response to the unpredictability of future’s needs and requirements for housing sector in the UK, which allows the occupants a degree of adaptability and choice in term of layout and multi-use of the spaces or space alteration according to their needs.

On a long term flexible design means physical changes to the internal layout through mixing units or extensions to adapt the house according to changes in occupant’s circumstances or update the house to comply with modern life needs (Schneider & Till 2007). Architects and designers have a major role to provide Flexible Housing, however housing design is a very complicated process, in addition to the design, material selection and construction process depend on many other factors such as cultural, social, economics, technical, regulations and environmental requirements (Friedman 1997). Analysing of flexible housing case studies shows that there is no one single solution to meet everyone needs and expectations. UK existing standard houses are inherently not flexible in their construction (Habinteg Housing Association 2011), for example to add a new extension, forming an opening in the cavity wall needs structure surgery or removing a loadbearing internal partition which needs a major structural work, so the better solution will be designing for flexibility and adaptability at a very early stage of the design process, think in advance and design spaces and internal layout to be able to accommodate future changes, design of multi-use spaces easy adaptable and flexible alteration can be made without the need for inspections by building experts or changes to the layout can be economic and simple (Schneider & Till 2007).

2.8. Space design to accommodate modern lifestyle changes

Ipsos MORI and RIBA published a paper (The way we live now) which was an outcome of a joint research to investigate and define the most reasonable way of designing and building 21 century homes in the UK to accommodate modern lifestyle using a qualitative approach through interviewing five different householders living in different situation to understand their expectation and needs and understand the key aspects behind their decision to buy a new built house, and what are the things they are looking for in a new house (Ipsos MORI & RIBA 2012).

The research offers a new method of thinking to plan and provide new good quality houses in term of design, layout, form and spaces which can accommodate occupants present and future needs as a short term plan and the positive impact of new sustainable high quality housing development on the community, economy and environment as a long term plan (Finlay, Pereira, Smith, Charlton and Hughes 2012). Constant population growth, change in life style and changes of household circumstances and needs are enough reasons to rethink about the necessity of optimising traditional design and provide a sufficient number of modern right type houses which comply with today and futures trend, avoid replicating small traditional design and layout creating an overcrowded and high density dwelling development which have a negative impact on economic, health and wellbeing of the occupants (Population Matters, 2012).

Demonstrate a good understanding of what the general public wants to find in a new home and discover the expectations of different range people, clarify the best way to optimise housing design in the UK (Finlay, Pereira, Smith, Charlton and Hughes, 2012). The key findings of Ipsos MORI's research can be summarised as follow: people are looking for larger open plan living area for socialising, extra spaces to accommodate domestic utilities, more storage spaces, private spaces, larger bedrooms, larger windows, more technology for a greater use of electronic equipment and better sound insulation. However the new developments did not offer modern lifestyle needs and couldn't achieve people's expectation and that is one of the main reasons behind people preference to live in an old traditional house which is more spacious and acoustically better insulated rather than living in a poorly designed new built house (RIBA, 2013).

The research recommended the necessity of educating people about the benefit of living in larger spaces and well-designed houses and the negative impact of living in small spaces in term of health, wellbeing and achieve maximum potential (S., Pereira I., Smith E., Charlton A. and Hughes R. 2012). The study by Ipsos MORI suggest that planners should provide minimum space standard for individual internal spaces rather than overall house area which has many complications and difficulties for both planners and developers, planners need to work closely with independent professional body or organisation responsible for the quality of new homes in term of design quality, space standards and internal layout then publishing all the information about new developments.

The important role of the government, planning authorities and professional bodies to work together and create a new set of space standards to be embed within the Building Regulation or may be set up new individual documents for space standard including both internal and external spaces. The planning authority should provide a mechanism to give the public free access to information about the new development and change the traditional way of describing and evaluating houses using number of the bedrooms and bathrooms and start to describe it according to the floor areas. To overcome this complexity, houses should be priced by floor area not by the numbers of bedroom or bathroom (Norwood, 2007). Most of the research participant had difficulties to assess the internal spaces they need or expect to have in a new modern house that is why an independent organisation needed to create a mechanism assessing the modern life requirements to help reshaping the house design, space and layout (Ipsos MORI & RIBA 2012). According to the research the space standard needs only for individual internal spaces rather than over all area to avoid complexity of the process, however it will not be an appropriate complete solution unless the overall house area is included. However another should be considered is the shape and the functionality of the space, because may be the required dimensions are achieved but the shape of the space is not functional, so while creating new cods for a space standard, shape and functionality of the space should be taken in to account internally and externally.

2.9. The relationship between size of houses and quality of Well-Being

Considering the relationship between the sizes of new built houses and wellbeing of occupants' health is an important area and should be explored in depth, however, in context of this study an overview of the impacts has been explained. A research paper by Foye (2016) examined the relationship between size of houses and wellbeing comprehensively, selecting two pathways, first, is looking at the relationship between space and activities and secondly, the influence of space size on social status. The paper provides evidence that adequate space has a positive influence on individuals and raised occupant's satisfaction. Another research carried out by the Centre for Comparative Housing Research and supported by the Research Unit at De Montfort University discussed the impact of overcrowded housing development on occupant's health and education (ODPM 2004). The paper examined different areas such as physical health, mental health, childhood growth, child education, personal safety and accidents, providing measurable evidence on the negative impact of overcrowded housing because of building small houses and inadequate spaces. This research approach focuses on measurable data, and the conclusion was that over 40 studies, evidence the negative impact of overcrowding on adult health, 25 studies support the relationship between overcrowding and mental health, 18 studies evidence the negative impact of overcrowding on child growth and education.

Morgan (2014) stated that, lack of adequate space in a house impact on the occupants live negatively and could result in degrade relationship among family members and reduce social activities. The research analysed 16 thousand houses and compared them with London Housing Space Standard Guide, and the result was that, 55% of the houses fall below the housing design space standard.

2.10. Chapter conclusion

According to the information and data collected from the literature review, previous studies and researches show that lack of minimum space standard regulation and housing shortage are the two key factors that lay behind reducing housing space in the UK. The majority of housing sector developed by private companies aim to maximise their profit through producing more unit outputs, and as any other companies, developers' must make money to pay their stockholders and achieve company growth. Abusing housing shortage through achieving the minimum Building Regulation Standard as a target is the second key factor. The developer knows that they can sell anything they build due to shortage in the housing market, and they know that the UK Government is more concerned to tackle housing shortage through achieving quantity, not quality, House Developers don't want to build above the National Minimum Standard unless it is required by Local Authorities.

Chapter 3 Literature Reviews (Housing Form)

3.1. Introduction

This chapter addresses the key issues influencing the form or appearance of houses built in the last 15 years, regardless the size, space dimension or functionality of the spaces. Using a mix of case studies, academic papers and media publicity materials which evidences the reasons behind the quality of design and architectural characteristic of newly built houses. The chapter also discusses the challenges faced by developers when trying to avoid replication of traditional design and produce more innovative building form. The advantage and disadvantage of changing the design, and the impact of these changes on the developers, cost, market and end users have been discussed. Using carefully selected cases study developments in different locations, a comparative analysis has been presented for traditional and modern housing designs looking at developer and occupants view and highlight the role of planning policy, codes and Building Regulations on the housing form.

3.2. Modern contemporary housing development

The problem is not only the replication of old house form and traditional design it is the incomparable solution to help UK Housing Developers making profit, achieve quality and tackle housing shortage. Housing Developers such as Rogers Stirk Harbour Architects, Alison Brooks Architects and Richard Murphy Architects were the movers, shakers and the creative mould-breakers in housing design (Mara 2013). They produced a modern contemporary form of design, successful achieving level 5 code for sustainable homes (Fulcher 2013). This section will focus and discuss Oxley Woods Development selected as a successful case study to be considered as a step towards changing new housing form.

Figure 10: Oxley Woods Development (Dezeen 2007)

Oxley Woods's project provided a new style of housing in the UK in term of form and construction, method. This article based on a research interviewed residents and occupants of these houses to understand their view and highlighting the advantage and disadvantage of this new to the UK method of housing construction (Fulcher 2013).

This project provides solutions to avoid replication of traditional style housing achieve the government's quantity target through offering prefabricated speedy construction and satisfy occupant's need and requirement. Replicating traditional housing style lacking spaces and character could be avoided through designing a new model housing such as Oxley Woods development which could be the solution to saves construction time and cost, satisfy occupants, larger and more functional spaces, modern look and achieve planner's density requirement.

The government planning for a new program for the next 20 years to reduce public housing crisis and achieve better public satisfaction (Rowntree 2012). RSHP developer answered this requirement through providing a new model of housing, which is a quicker construction method using prefabricated elements, reduce the cost by 40%, meeting the zero-carbon target and provides a modern form, larger internal spaces, large amount of glazing and a more functional internal layout. In addition to the aesthetic and innovative methods, developer embedded green technology through its form design called Ecohats to provide natural ventilation and improve heating demands.

Figure 11: Oxley Woods Development design concept (Dezeen 2007)

There is always a risk of unpopularity in the housing market when producing a new model housing style. After 18 month a survey result showed a very high satisfaction of Oxley Woods's occupants.

Most of the occupants' positive feedbacks were on the larger windows, larger corridors, wider staircases, high door frames up to the ceiling, larger spaces look, more lights, more clear functional spaces and aesthetically pleasing, this project is different from all other traditional style mass housing production which have small spaces and lacking light and architecture look. However after building 122 of the 145 houses the developer decided to choose an alternative traditional design for the final phase of the project which impacted negatively and disappointed the residents who complained against the company claiming its lack of spaces, character and innovation (Fulcher 2013).

Oxley Woods's development proves that the UK government, planning authorities and developers need a realistic understanding of balancing between the housing program and public needs. Rather than reducing the internal space to cut cost and provide traditional housing to avoid the risk of marketing, they can look at a new model such as (RSHP) housing in Oxley Woods which provided a successful example for a good quality model housing with different form, layout and internal spaces which can influence other mass housing provider to take the step forward and stop replicating traditional style housing and spend money on marketing tools.

This project sorted out many of the key issues and problems with traditional style in term of space functionality, natural light, modern look and architectural characteristics (Dezeen 2007). Most of the developers are not interested in changing the way they design and build to avoid unforeseen circumstances and avoid the risk of unpopularity and marketing (Fulcher 2013). Oxley Woods provided a good example to encourage other developer within the industry to move forward. Having a successful housing project like Oxley Woods and the experience of the RSHP developer, should encourage for a deeper analyses to provide a better quality design solution and plan a new strategy for housing development in the future.

3.3. Housing Design & Layout (Design, Flexibility & Adaptability framework)

A research by the Commission for Architecture and the Built Environment (CABE) challenges that, design impact the value of residential development radically, this study compared eight completed developments which are a selection of different housing design schemes in four different location includes both standard traditional design housing style with other houses used more innovative and well-designed strategy and both schemes had same capital cost, the fact is that increase in housing density to achieve the government and planning authorities target will decrease the unit value (CABE & ODPM Design for Homes 2003). If the nature of housing design and layout changed in a way provide more innovative design and higher quality unit the developer can balance between the density increase and the unit value (Langdon & Everest, 2003).

Pressure by the government to tackle housing shortage resulted in providing high density housing developments, in addition to health and wellbeing issues building smaller houses using traditional style design to achieve quantity resulted in affecting quality, decrease the unit value and reduced public interest in new build homes.

National survey in the UK (GOV.UK 2013) shows that the buyer or occupier are not interested in buying new build homes and prefer to purchase old traditional houses in an existing established district. Developers maintained their unit value through decreasing the size of new houses, recycling traditional design which lacks innovative design in term of form, layout and character and using different marketing tools for selling their units, despite the fact that market suffering housing shortage, the public has lost interest in buying new build homes (Langdon & Everest 2003).

However, this approach will impact negatively on the whole construction industry market when people attract to live in an old house rather than a new build house and also result in producing large amount of new houses lacking details and quality which lead to poor performance and impact on consuming more energy to heat or cool the house which means increase the life span cost for the occupants and increase dissatisfaction.

The CABE research uses eight development projects to create a mechanism which can be used by planners and developer to make a comparison between any developments in any area or from any size to improve how the good design and attractive layout can raise the value of houses and show how the standard traditional design and layout are not working in a high density development and doesn't fit the purpose. Developers can raise the value of properties in a higher density development through avoiding repetition of standard traditional design, they must spend more on design, give the architects and designers freedom to provide more innovative design with attractive form and layout in higher density developments. CABE research assessed the value of good design in a high density schemes, and how a good design can impact on the developer's profitability in a way they can maintain the unit value and increase public interest to purchase new build homes and on the other hand meet the planner's requirements (Langdon & Everest 2003).

3.4. Main factors resulted in producing the houses we see today…

For most of us home is the most expensive product we will ever buy, it is a major purchase. To buy an old property you have to plan the cost for the upgrade and refurbishment, but when you buy a new house you can choose and design your kitchen or bathroom before you move in, developers have so much to offer (BBC 2014). Most of the developer focused on the family market building homes through the range of two-bedroom houses up to five-bedroom houses, average selling price is between £180,000, and £260,000, as an example Persimmon Homes sold 11000 on 2012 generating profit of £300 million (DCLG 2015).

House prices is rising all the time Barratt Homes profit soar by 160% because people think that if they don't move now and purchase a house, house prices will go up. Good location has an extreme demand for housing. Historically in 1930s 200,000 to 300,000 a year has been built (DCLG 2015), but what is so special about it is that many of them were privately built, and that is why we see a range of different style houses, large gardens, large rooms, different material, different layout and houses had a character. To encourage economic growth and achieve the demand, bank interest rate were cut to almost zero, which made it cheaper to borrow money; on the other hand houses are cheaper relative to wages than we see today. Small firms were building most of the houses (BBC 2014).

For the developers planning conflicts add the cost of acquiring land, making it one of the most expensive elements of the whole business. So for a house of £200,000 land cost will be around £50,000, however in some part of the country land accounts for up to half of the total price. Land price radically increased during the last 30 to 40 years (BBC 2014). Conflict with planners and the public is another cost adding to the land price and has a big impact on the price of the new homes. The restraints of planning system are other key reasons behind the high house prices in the UK.

All the reasons mentioned previously resulted in withdrawn of most small firms and individuals from the industry and housing market and UK housing sector controlled by few large companies, which resulted in producing the houses we see today, as a result of the price increase developers started to reduce space and use the same design, material and form to recover the land price and keep the profit. No architects has been near the houses that we're looking at today, clearly this can be seen through all the little details have been thrown at the buildings to increase the value, for example porches with three column, which never been designed by Georgian architects or Classical architects because the middle is where you expect to go in (Cragoe 2008). What we see today in these new developments are buildings which are undifferentiated, and go on and on for ever, could be anywhere, built from same materials, mass production used all over the country, but these buildings are staying possibly for 100 years or 200 years, and they are not going to get any better.

House developer need to make the product that reflects our modern lifestyles (BBC 2014). To offer a new market for a completely different sector which looks for a larger house with fewer rooms removing a partition wall and merging two bedrooms into one bedroom which means adapting to the users need with minimum cost and construction involvement. Construction industry is an industry will resist change (Life Homes Design Guide 2011). This documentary program outlined the main issues affected house developers through the years which resulted in producing the houses we see today (BBC 2014). The suggested solution are launch a competition to build more affordable houses, challenging the developers to develop ways of constructing cheaper houses using different materials, different form and layout, encourage house builder to look and learn from other European countries using new methods and techniques.

Other suggested solutions by BBC program to bring the house price down is building on Governments-owned land so the cost of land wouldn't be included in the final price, future buyers will pay for the construction cost and the land remained in Governments hands. This solution will encourage individuals and small companies to build better houses focusing more on architectural characteristic and style, having larger spaces, better quality and modern look. Constructing a new house from materials to labour is about 25% of the final price, another 25% on larger development, another big cost is local amenities, then another 15% for profit. According to the housing statistics on 2013 only 130,000 new homes were built out of 248,000 homes which is the target to meet UK's housing shortage (DCLG 2015).

Considering the main two important factors allowed house builders to build so many houses, cheap, plentiful land and almost complete absence of planning regulation. The houses were built on very generous plots Seven to ten per acre with a great attention to the exterior appearances and quality materials. However, after that the UK government produced tough planning regulations and all the builders should apply for a planning permission which takes a long time and it's highly uncertain to succeed, on the other hand new laws for protecting the countryside around the big towns and cities (the Green Belt) was another reason to slow down the process (Smith 2016).

Table 8: House price in the UK (Nationwide 2016)

The graph clearly shows a rise in house price notably and as mentioned the main two factors impacted on housing price are complexity of planning regulations and land price.

Land price risen significantly due to, strict Green Belt Regulation and land price is not fixed, which means, by the time developer obtain planning approval, the price of the land increase significantly. The developer should obtain planning approval within 13 weeks normally, however, it takes more than a year at the present time, and within the year the land price will change dramatically and the extra cost will be added onto the house price (NDS 2016). Another issue to highlight is the ratio of house prices to income is imbalanced. House price increased by an average of 7.6 times the individual annual salary (ONS 2016).

Table 9: House price ration to income (ONS 2012)

Increasing the gap ratio between the house price and individual income rate made it difficult for byer to apply for a mortgage, increasing this gap means that first time buyers needs to save a higher deposit and borrow more money and pay higher interest for a longer period.

Table 10: Drop in affordability to apply for mortgage

Buying a house becomes harder and tougher as the house price rises faster than salary and new rules for affordability checks and increase in bank base rate are another reasons impacted the affordability of house price (Shelter 2015). To tackle this problem UK needs to build more affordable houses, however, not through reducing the size or replicating older designs, there should be a proper plan to reduce land cost, provide a fixed price for the land and encourage developers to change the way they build, to use a more modern method of speedy construction to achieve the required housing target, and a more relaxed regulation to make it easier for the developers to obtain planning permission.

Figure 12: Hot Properties (BBC 2014)

The UK Suburban housing mostly built by Private Developers, this trend has started since the year 2000, when Local Authorities, Housing Associations and small companies stopped building houses and few Mass Developers took over the housing industry. These Mass Developer has a bank of recycled design which will be modified slightly and tiled to the site for every development. Developers save time and cost of the design process. The result is a similarity in housing design all over the UK. The advantages of replicating and recycling old design are moving the industry towards more standardisation, which benefit the developers and end users as well.

In addition to the benefit of saving design cost, similarity in housing design allow developers to purchase a large amount of house elements and materials, then bring the prices down to a minimum, which means cheaper houses to be constructed and provide more affordable houses to the middle class who are the largest portion of the UK population. On the other hand, because the houses are identical and similar in design, putting them together in a row and create a terraced style make them cheaper, which is still a common style in working class and middle class areas. Small foot print and similarity in design made these houses cheaper to maintain.

The solution for building more houses to achieve the housing shortage target is either building on a brown field which is easy to obtain a planning permission or other suggested solution is the need for radical ideas such as releasing more of green belt land, which is one of the fundamental problems, otherwise cities can't expand, people can't have high standard of living which they can achieve through building more houses and cheaper houses, the green belt is what stops that happening (Anderson 2015).

It is not very simple and practical to build on brown fields due to nasty surprises such as some former industrial sites may be polluted and need treatment (can be expensive/difficult) the location may not be exactly what you want and so is a compromise former industrial sites are not always well recorded and may produce nasty problems (e.g. old mine shafts). This documentary program by BBC outlined the main issues affected housing sector in term of form, layout, size, cost and number of house production in the last 100 years, which can be used as a guideline to highlight the standard issues, affecting housing design, adding to these change in modern life style requirements and other environmental issues to complete the circle of factors affecting housing design (BBC 2014).

3.5. Form and architectural characteristic problems associated with new built houses

Each individual housing development has different challenges, circumstances, requirements and aesthetic concerns that affect the project design. However there are some shared key factors influencing most of the housing which can be highlighted as followings: Client's relationship with the architect or designer, program, regulations, context, nature of the site, technology, national and international sustainability requirements cost and time (AIA 2007).

The main key factor is the client, a client with a clear understanding of the budget, project schedule and final visual aspect of the project, producing a final design which comply with the planning authority requirements and achieve the expected profit. The communication between the client and the architect will be the major factor affecting the final design. Community consideration is another factor which affects the design and final form of the housing development. Clients with the design team should justify the project to avoid any conflict with community groups, pressure groups and public. Housing development justification to achieve public satisfaction and objection targets will affect the design dramatically. Building regulation requirements and codes are another factor influencing the design. Regulation such as achieving high standard of safety or prevent building on green lands Increased the limitation of the overall design. Context consideration, many times the existing fabric, colours, materials and pattern on the surrounding houses and adjacent buildings will affect the design if used as a starting point. Other factors such as nature of the site in term of topography, orientation, wind direction, temperature, level of humidity or building in a flooded area will affect the design strongly (McElhiney and Joseph 2007).

According to Housing Matters magazine 2015, the need for building 248 000 homes in the UK every year require meeting sustainability target on a large scale, in a way the design must reduce the environmental impact while achieving high standard of life quality (Riley, 2015). Budget limitation due to high land price will impact dramatically on the design decision in term of size of the house, form and shape of the house, selection of the materials and units outputs to achieve the expected profit. Demand and need to cover the housing shortage in the UK have a strong influence on how the houses been designed, time limitation to explore new design push towards using standard designs to avoid unforeseen circumstances (Griffith, & Jefferys 2013). Stefan from Urban Design Group highlighted most of the problems facing new built housing design and layout.

An interview by The Guardian Newspaper conducted with design experts to explain most of the common problems facing newly built houses in the UK, highlighted that, few large developers in the UK controlling the market of housing development (Brian and Alamy 2015). Replication of the same houses can be seen everywhere, same form design and material, all the development and communities looks the same, no identity and difficult to distinguish places according to their architecture characteristic (Kruczkowski 2014). Figure 13 shows some of the examples of typical building layout in the domestic building sector.

Figure 13 Problems facing new built housing design (Kruczkowski S. 2014)

Other problems such as having 3 to 6 wheelie bins for each house is another problem facing new built houses and plagues the streets, lack of design for having a space to accommodate the wheelie bins require new waste and recycling system (Brian and Alamy 2015).

Figure 14 Problems facing new built housing design (Brian and Alamy 2015)

Traditional development recognised with tidy and organised straight streets and layout gave it a character. However most of the new development looks a mess due to different facing direction of the houses and streets resulted in communities lost their identification (**Brian and Alamy 2015**). Figure 14 show some of the examples of the impact of the bins on the front of the buildings.

Figure 15 Problems facing new built housing design (Brian /Alamy 2015)

Streets with a dead end and many closed areas can be found in the new developments layouts which discourage people to cycle or walk and sometime needs to take unnecessary longer route to move from an area to another area, all this will discourage healthy lifestyle. This challenge is shown in Figures 15 and 16.

Figure 16 Problems facing newly built housing design (Brian /Alamy 2015)

Car parking is another issue which creates conflict between neighbours, lack of car park or shared space become a serious problem and created unhealthy environment (Kruczkowski 2014). The picture in Figure 17 is a representation of a lot of UK streets showing the implication of increased population of cars per household and the lack of dedicated parking areas in the front of buildings.

Figure 17 Problems facing newly built housing design (Brian /Alamy 2015)

Lack of green areas, to reduce the cost and maintenance, using hard material to cover most of the development, as each tree cost the developer over £1000, however sometime neglected useless green areas impact development aesthetic negatively.

Figure 18 Problems facing new built housing design ((LV 2015)

According to the Liverpool Victoria Insurance (LV) company report on the houses been built on brown field, 1 in 10 new built houses in the last 15 years had problems. And nearly 125 million square meters of brown lands used for building new developments which is nearly 500,000 houses, are at risk of contamination or high risk of flooding (LV 2015). The data from LV report shows that 79% of the new built houses in the last 15 years were built on brown filed which in addition to contamination and flooding risk they are suffering from badly designed drainage and sewage (LV 2015).

Chapter 4 Methodology

4.1. Introduction

This chapter consider as a key part of the study, underpinning methodology approach including chosen methods to achieve the study aims and objectives and discuss the rationale behind the selected methods. Addressing common problems among most of the new build houses in the UK and provide an in-depth insight on the specific issue of size reduction and layout design of new build houses which require an adequate consideration and well planned research strategy. The chapter provides three subsections: aim of the chapter is to address the gaps of previous studies; discussing research methodology and adopted methods, looking at the criteria used to select participant and provide information about their discipline and backgrounds.

Reviewing literature chapter indicates to the high amount of attention paid by the public and the media to the unsatisfactory designed new houses in term of small spaces and traditional replicated form design highlight the negative impact of area reduction on the national economy and health & wellbeing of the end users. However Planning Authorities and developers paid less attention to these problems and their justification is related to tackle housing shortage and the many other complicated issues behind their approach such as land cost, planning approval, strictness of Green Belt Regulation, lack of skilful labours and many more. This chapter aims to design an appropriate methodology to underline the gaps of the existing studies and literature which resulted in providing small and uncharacteristic houses and provide the adequate methods to find answers for the research questions.

4.2. Research Methodology

There are different primary methodologies approaches can be used to answer research questions and achieve objectives, either qualitative or quantitative approaches or combination of both techniques. Quantitative methodology, if the study requires realistic perspective (positivist), and is more about numbers and data generating from either survey or experiment to be discuss, analyse and resulting in more definitive perfect outcomes (Lewis S & Thornhill, 2007). Qualitative methodology, if the study requires theme identification or in depth discussion (Interpretivist). The qualitative approach aims to understand people's view and community concern using interview, case study, observation and document analysis method, which designed to a more subjective based research about human behaviour related to their perception, ambition and sensation (Bolton 2014). Qualitative approach needs content or thematic analyse looking for similarity in themes and perspective or identify different uncommon areas.

Qualitative Methodology is leading this study considering the necessity of having more detail and in depth insight at the topic using different methods such as interview carefully selected participant who are experts and professionals working in the public and private housing industry to answer research questions, trying to expand on their view and opening new areas to investigate (Smith 2008). Real life case studies and visual analyses used to support discussion and analyses due to the subjectivity of the topic.

However there will be some disadvantages to use qualitative technique because; it will be difficult to generalise the outcomes, as fewer people is participating in this type of methodology or the difficulty to have a more systematic analysis due to high subjectivity of some responses, and sometime outcome information depend on the level of experience chosen for the planned interview or questioner (2007 Lewis S & Thornhill). To overcome this issue quantitative methodology adopted as well to frame the facts and detect patterns which could help quantifying expert opinions and support the qualitative outcomes (Wyse 2011).

Other available methods for this study is Meta – analysis, which is, examining the outcomes of different studies to conclude the direction or the average impact of the results and highlight what other studies stated about the quality of design in term of size and form. However, not many researches on this topic could be found to draw an adequate conclusion.

Accessing government and Local Authority's data could be another effective method to give a wider context to this topic. Looking at the exact numbers of houses has been constructed by developers and followed traditional style, then underline the exact number of houses followed a different design approach, to find out under which circumstances, these house have been built and why the approach not been followed everywhere else in the UK.

Other methods such as descriptive quantitative could be used involving a large sample of public view and collect numerical data through a carefully designed questionnaire to be completed by the occupier of the new built homes and have a realistic, up-to-date feedback about the impact of small spaces on their health and their lifestyle, clarifying the level of their satisfaction then compare the outcomes with other occupiers living in an old style house. Involving public could change the direction of this study to a more social science study and required time and financial support which wasn't available for the scale of this type of research.

4.3. Research Methods

Qualitative approach includes number of methods such as interviews; focused group, document analyses and practical research components which help identify and describe the problem subjectively depending on participants view and look at the problem in more depth (Smith 2008). Chosen methods for this study can be summarised as below:

1- Semi structured interviews conducted face to face with 8 participant coming from an architectural background working for private and public house developers to understand the rationale behind their designs approach in term of spaces and layout design, using 12 carefully designed open end questions based on the research problems which took on average approximately an hour for each interview.

These interviews targeted some of the largest developer such as Taylor Wimpey, Persimmon, Barratt and David Wilson homes, and private developers such as IDP Architects, to outline the factors lay behind building small houses, replicate traditional design and highlight the problems preventing them from change and create new housing models in term of space design, form and layout, specify the factors driving their design and underline their target. It was necessary to understand what kind of market research they do to involve and share people views within the design approach. Study and analyse the factors drive the design process for new build houses and find out answers for the research questions.

These interviews have been recorded on a tape and transcribed word for word, a copy of the transcript can be found in the appendices. Content analysis has been used using SPSS to label and code the variables to describe and identify content pattern using coding system which allows connecting back the outcomes with the quantitative methodology results to establish reliability and support the final conclusion as this method is completely descriptive (James, Drisko & Tina 2015) .

Comparing the answers for each interview question addressed the issues and factors affected housing design in the UK. Participant provided their personal recommendations and opened new areas to consider, each question analysed separately, patterns within the answers identified and shared key points highlighted (2007 Lewis S & Thornhill).

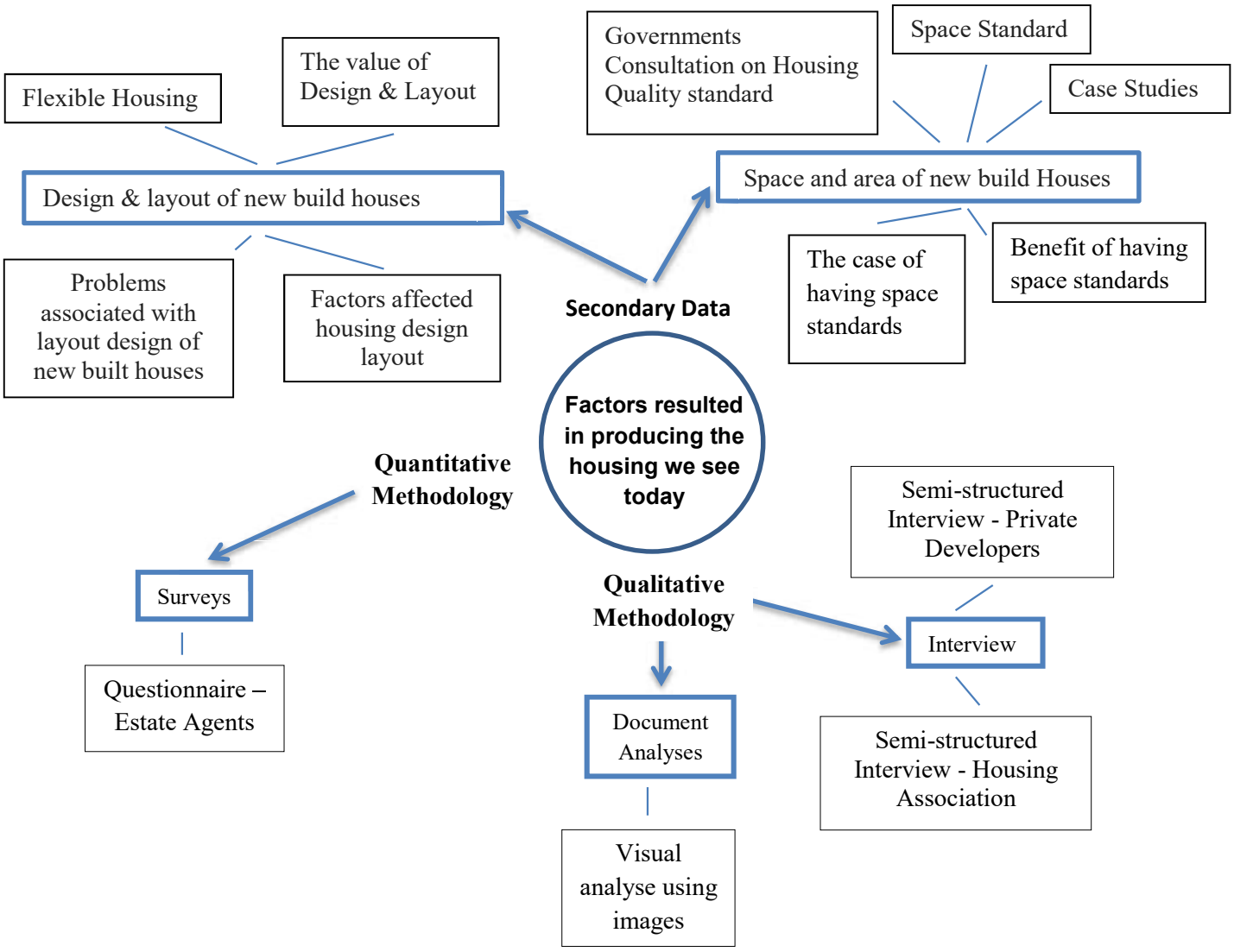
2- Visual analyses method adopted gathering marketing broachers from different new developments contain different type of new built houses design, plans and images. Looking at these images in many different ways, capturing similarity of layout design between different houses built by different house developers in different locations and outline similarity between old and new houses to prove replication of traditional layout design over decades and reinforce research objectives.

3- Carefully prepared paper questionnaire consists of 11 well detailed questions with option of adding extra comments targeting 50 estate agents in 4 different cities (London, Birmingham, Coventry and Leicester). Estate Agents targeted due to:

- Their expertise and professionalism in the housing market
- They can provide realistic information about barriers and problems facing new built housing marketing
- They are the active link between the house developers and end users
- They obtain feedback from occupants regarding space design and layout design
- Assessing their personal opinion about their personal choice of living in a new built house

This questionnaire help to outline the key reasons drive customer's choice to understand why people lost interest in the new build houses and underline the barriers facing estate agents while selling or renting new built house.

Diagram below simplify the steps undertaken to collect data and shows the used methods to obtain answers for the research questions and achieve the objectives.



4.4. Samples Selection Method

This section describe the participant's selection criteria for this research in term of their discipline, background expertise, the size of the companies they work for, and their involvement within private and public sector. An overview of the detailed semi structured interviews has been addressed to determine the effectiveness of the results. Samples of participant should be selected depending on the nature of the research questions. There are two different sampling methods; either random samples or quota samples (Marshall 1996). Quota sampling technique is used to purposely select people having a particular knowledge and specific expertise area in housing, this method is reasonable for this type of research to be interviewed and questioned.

To have more accurate outcomes due to having difficulties generating information with this sampling method, it was better to divide the participant into two groups, firstly, group of experts in designing and constructing new houses to be interviewed, secondly, group of estate agents who are experts in marketing new houses and also obtain end users feedback. Qualitative methodology is the main drive of this study however quantitative methodology adopted for internal reliability test. In addition to the adopted mix methodology, data and information collected from the literature review help creating strong ground to highlight the factors resulted in producing new built houses lacking adequate space and architectural character. The rationale behind this combination is the subjectivity and complexity of the issue and the involvement of different parties in the process such as Public, Government, Planning Authorities, Building Regulation, Suppliers, Private developers, Housing Association, Estate Agents, and pressure groups.

4.5. Selection criteria

While mix methodology research aims for a deeper understanding of the issues rather than a shallower description, the samples selected for this research based on three criteria:

1- Participants from Architecture or designer background working for private and public housing sector.
2- Estate Agents as experts in marketing new built houses
3- Volume developers existing data

4.6. Selected participant's discipline and backgrounds

As a first step, interviews has been arranged with eight experts and disciplines from practice working for well-known companies leading housing developments in the UK:

A. The Associate Director of an architecture firm, which is one of the multi discipline practice leaders in the construction industry, they involved heavily in developing housing schemes for private developers such as Taylor Wimpy and Morris Homes, building many houses for individual smaller private developer.

B. Design Active in a well-known architecture firm worked on major housing projects, major public sector site, arranging architecture competition for developers, working on exemplar housing scheme quality assurance, working with Housing Associations, designing Life time homes, specifications, tender, contracted, quality houses, code 5 or 6, Passive House Refurbishment, design the first passive house design tower.
C. Design Manager working for one of the Major Housing Developers which is one of the nationally recognised and award winner of the highest quality, Best Sustainable and Best Design Award, developer of the year award, a developer retain a five star rating homes for many years.
D. Technical Manager working for one of the top 20 UK house builders.
E. Architectural Technician for a private architecture company.
F. Architect working for a chartered architectural practice with extensive expertise in housing sector and award winner of quality approach, dealing with clients from housing associations, local authorities, partnership developers and contractors delivering a different range of affordable and social housing, private and supported housing.
G. Accredited SAP assessor and senior architectural technician working for a very old Chartered Architects practice, working in housing sector.
H. Developer & Maintenance Manager working for one of the midlands housing organisation and one of the leading house developers in the UK, providing affordable and sustainable homes in all midlands, working in collaboration with planners, private and public developers.
I. Senior Architectural Technician working with one of the UK's leading private developers.

As second step broachers for marketing new build houses collected from 5 different developments in West Midlands, these houses are developed by three major house providers (Barratt, Taylor Wimpy and Persimmon Homes). More samples collected from online sources to support research discussion and analyses.

Third step was carefully designed paper questioner consists of 11 well detailed questions with option of adding extra comments targeting 50 estate agents in 4 different cities (London, Birmingham, Coventry and Leicester).

Chapter 5 Findings & Analysis

5.1. Introduction

This chapter focus on analysing and interpreting the data generated from interviews, questioner and collected document as explained in section 4.1.3, targeted architects, designers, builders and estate agents who are experts, working in both private and public sector, they are responsible for design, build and marketing new build houses, having a major influence on shaping our life and cities. Using interpretative philosophy to investigate interview contents, following a range of procedures and framework to translate the collected data to a more specific and dynamic explanation and highlight the key shared words and look for relationship among the opinions and statements (Haregu, 2012). Inductive approach applied to analyse the content because qualitative approach is the main drive of this research involving semi structured interviews with different participant having different experience and views, recording participant concepts and views to create a more systematic approach representing their understanding and perspective, and on the other hand highlight the shared words repeated which can be used as a substantive evidence to prove analyse efficiency. However analyse process start with transcribing recorded interviews and organise the data collected from questioner and documents, categorise them under different sections then specify a framework followed by sorting the data and apply a descriptive analyse to the framework. There are two different framework type to organise and analyse the data either explanatory or exploratory framework. Usually research questions is guiding explanatory framework and generated data is guiding exploratory framework (Lewis S & Thornhill, 2007). For this study exploratory framework has been used to organise and sort out the data, then arrange the responses under different categories to identify repetitive themes and build an order sequences to answer research questions.

5.2. Analysing Research Interviews

This section aims to analyse and interpret data collected from interviewing eight participant using semi structured interview method as explained previously in section 5.1.7. Participants were coming from architectural background, experts working as architect and designers in practice for some of the major and well known property developers who have influence on the design of new build houses. Two main objectives to be achieved through these interviews, firstly: to understand architects, designers and developers view, the rationale behind their thinking and the reasons prevent them from change. Second objective is to underline real solutions suggested by them to tackle the problem of size reduction and traditional design replication without affecting quantity output and developer's profitability. Content analyse technique used to discuss and analyse these interviews using interpretative method looking at the pattern and shared key points among their answers to create a context bond (Haregu, 2012). Samples of the questionnaire can be found in the appendix 7.1.5.

5.3 Interview interpretation

Participants were asked about addressing the key factors influencing housing design in the UK, is it either architecture influence, marketing influence or planning policy influence? The reason behind asking this question is the complexity of housing development process and the involvement of many parties: Government, Planning Authorities, Private Developers, Housing Associations, Building Regulation, Pressure Groups and public. This question aimed to understand the key factors resulted in producing houses lacking adequate spaces and architecture characteristic. When participants were asked to express their views concerning key factors, they provided wide-range of answers. Below are excerpt's interview comments:

Participant A; *"…emphasised that maximising the build cost to value ratio is the concept…"*

> *"If we talk about the house developers they have absolutely do not care about the quality of the new buildings, what they do they define their specification, by process of using buyers to agree the spec of the walls, the targeted windows they were using and the floors, and they keep doing that over and over to bring every last piece of the building down to the cheapest it can possible be for their general specification. They design their buildings themselves they design them in a purely technical way that has a very limited architecture in it. The size of them is come out of absolutely optimizing the size a unit needs to be for a certain type of family or type of demographic, so the type of houses or design of a development will start with what the market house can sell the houses for, they don't want to build a single square foot more than is necessary to maximise the build cost to value ratio. In some areas they can create values if you are in south east some time it will the case of adding balconies or adding room nice big spaces or big gardens, because in those locations you can sell the same house for more money if you have these extras to the house" (*Associate Director of an architecture firm).

Participant B; *"…stated that driving down cost so they can pay as much as they can for the land…"*

> *"Generally it is coming from the theory of "garden city Follow your money" the whole idea is about driving down cost so they can pay as much as they can for the land, every piece of land come out to market and the agent will say who wants to buy the site was most you can give me, you must give me the highest price, so either you need to build more number houses, or build the cheapest houses they are the one will win the site, the whole industry is about to try to pay as much as possible for the land, which means there are nothing to spend on building quality"* (Design Active worked on major housing projects).

Participant C; *"…stressed that size and form of design of new build houses directly influenced by market demand through researching the market gap…"*

> *"Marketing has the main influence, we do a lot of marketing research for each development individually, the research marketing is more related to the size of house and the bedroom numbers people are looking for, the local authority they done their own evaluations in their area, and already they decided how many one bed, two beds, three beds, bungalow, detached or terraced required, then they come to us and say that we need 20% of this type 30% of that type, give us a breakdown and if we deviate from that housing mix they will refuse planning. We are tied to a very safe mind-set, as Barratt and David Wilson we are looking at all new method of construction, for example the new Lego method we are still looking at it and we are going to Japan to see some of these modular houses, Just looking not building it"* (Design Manager working for one of the major three housing developers in the UK).

Participant D; *"... highlighted that square footage of a house has an effect on the price and should be tailed to the market…"*

> *It is coming out of the cost; the square footage of a house has an effect on the price, some time you can charge £200 per square foot and sometime you charge a lot more per a square foot, you have to tailed to the market, you might have a 600 foot two bedroom house which has a certain value, we have a range of house types, we design small 2beds and large 2 beds, you need to comply with the mix required by planning authority. Despite the fact that timber frame house is more adaptable for changes easier than knocking down block or brick walls, even with timber is more easily to create larger span openings which is difficult with traditional cavity brick block construction you can't create big openings, from the house builders point all is coming down to the cost"* (Technical Manager and member of the design team for major housing developers)

Participant E; *"...stressed that land is very expensive, materials is very expensive and market has the main influence…"*

> *"Life time Homes are larger homes, the house been design to live the life, and if the peoples situation changes, the house could easily adaptable, land is very expensive, materials is very expensive, when the government ask for a life time homes same 2bed house on 600 foot become 800 foot 2bed due to big expense on bigger circulation areas, wider corridors, lift access, adaptation of one of the down stairs room to a bedroom, has influence on the size of the house, regards the actual design of them we very much been a national house builder , very proud of the traditional way and the brand we have, we dictated the wrong word but our head office design all the house types, spending a long time tweaking them and changing them and making a little alteration on them over years, it is a core range of designs come to us and we build them we don't have that much influence a part of a little change in the size of the kitchen make it smaller and the living room larger or vice versa, for example open plan are quite a modern approach and developer are very traditional but worried to apply modern ideas"* (Architectural Technician design houses for a private architecture company).

Participant F; *"...emphasised that market safe mind-set is the drive (mortgage lenders and insurance providers) which is again can be translated to market influence…"*

> *"Building Regulation has a major influence as well, I think British Housing Sector it is more about bricks and mortar, there are far more mortgage lenders for brick and mortar than there are for timber frame houses. Despite the fact that timber frame house is more adaptable for changes easier than knocking down block or brick walls, even with timber is more easily to create larger span openings which is difficult with traditional cavity brick block construction you can't create big openings, from the house builders point all is coming down to the cost"* (Architect working for a chartered architectural practice, extensive expertise in housing sector and award winner of quality approach).

Participant G; *"...outlined that house developers design for mass production and design quality have been compromised by producing in a most economical way…"*

> *"One of the key factors influencing the design is achieving the required coverage that actually makes is the value of all the houses you designing or plotting on that site meet or exceeds the land value that they paid, usually it is quite high so you end up, a lot of the time with the design quality is been compromised by the very fact that you have to squeeze them in and really maximise it, really make them efficient, you given a book of templates just floor plates to design it to be the most economical way of delivering a three or five bedroom house, we have a very limited pallet of freedom may be change some materials but they don't like you to touch anything structural on them, it is purely from a process that they are volume builders, they have to deliver volumes, if they have to start building every single product bespoke they don't have the internal infrastructure to coop with that, just like IKEA for example if you want to build 10000 wardrobes it has a different door size double effect the delivery of them being able to deliver 10000 of the same wardrobes, they design for production it is a fare description"* (An accredited SAP assessor and senior architectural technician working for chartered architects practice).

Participant H; *"...stated that for the volume develops market this is the key, developers want to build and sell quickly, more become system building style and we have an acceptance in history of small houses for workers..."*

> "*In term of choice of housing style there is one very big thing related to history, because UK is industrial revelation country, people in England used to the idea that cities grow with a row of terraced houses, built for workers, and still we have large number of back to back very small tiny houses, we have an acceptance in history of small houses for workers,* ***The whole economy of an entire town started with one business and rows of terraced houses, it become a traditional.*** *In term of style Contemporary architecture is extremely costly to get the right design in this country, it is easy in somewhere like Spain because they don't have thermal insulation and condensation problem that we have it in the UK, external wall brick and block which drives our house types, it is very good for our climate and market and the whole market is built on it, developers want to build and sell quickly, more become system building style, historically wasn't necessary to be built quickly, they want to build only what they can sell to keep the price up, they don't want their money to sat in standing stock, for the volume develop market this is the key*" (Developer & Maintenance Manager working for one of the leader developers in the UK).

After careful consideration of the participant's view and using SPSS to label the variables, shared key points can be seen alongside all the answers which can be connected back to the first objective: To determine whether space design and layout design of the new built houses in the UK are influenced by designers, market, regulations or planning policy. All participants agreed that the main factor impacting the way they design houses is **market influence** which have a negative impact on the space design and architectural aspect. It is purely about maximising build cost to value ratio and as a consequences this action resulted in producing small houses lacking architecture characteristic to maximise the number of unit output and marketing value. Developers don't want to build a square meter more than what is required, which means achieving minimum building regulation standard and minimum planning authority specifications is the target. Marketing has the main influence and developers looking at the houses as any other normal products and mass production. As the expert from IDP mentioned replicating traditional design and defining their specification aims to bring down the last piece of the materials to the cheapest it can and doing that over and over, this technical thinking resulted in producing smaller and similar houses everywhere with a very limited architecture involvement. To conclude housing construction is market driven, increasing unit output through building smaller houses and replicating similar form to maximise developer's profit is the key factor.

Table 11: Traits associated with housing space reduction and form repetition

Trait	Repeated Terms	Frequency
Poor Design & Building Quality	Market Influence	8
Space Reduction	Driving down the cost	6
Replicated Form	Driving down the cost	6
Expensive	Land Price	4
Small and similar form houses	Mind set	3

Looking at Table 8, frequency of response show the result for **market influence** is 8 out of 8, all participants agreed on the key factors influencing housing design quality is market influence and the drive is not architecture or planning requirements. 6 participants agreed on the reasons behind size reduction and replicated form design which is maximising developers profit through building smaller houses to provide more units and design replication to create a standard model help bringing the cost down to minimum, however 4 participant highlighted the recovery of high land cost through reducing the size of new build homes and another issue is the market mind-set which require particular method of construction to provide mortgage and insurance. Public mind set is another angle to look at in the future researches to see if public mind set could be the reason behind designing small and similar style housing. Interview responses answering objective one clearly (To determine whether space design and form design (appearance) in the new built houses are influenced by architects, market or planning policy).

Question 2: Participants were asked about the type of market research they do to understand people's requirement or at least share their views in the design process. Aim of the question is to show the influence of market and maximising developers profit are superseding the end users requirement

Participant A; *"…emphasised that public has no influence on the design it is more about market supply and demand…"*

> *"There are two side of this: one is the local authority; it is their responsibility to specify what the housing need is. They have a lot of information on particular social housing and they have a list of the number and size of the families need housing, usually drives the percentage of affordable and what type of housing should be put in. and secondly we go to ask the estate agents and property expertise, marketing companies. The point of engagement with the public is after feasibility to design our scheme essentially the shape of it, asking people for their views? No one really interested particularly in the design of the houses, it is more about the principal of having the houses there"* (Associate Director of an architecture firm).

Participant B; *"…Architects and designers use consultation but within the scope of the developer not what the people wants…"*

> *"People been desensitized what good house it could be like, they take what they given because it is all the same for house builders, market driven. Planning policy is forcing a certain level of density development; it is more about achieving numbers and coverage, and build to minimum quality and specification they worked out. Very rear the planning authority asks for higher quality may be for a specific area. Some time we use consultation but within the scope of the developer not what the people wants, people want to pay money for maximising the space they get for their money, If you have two houses at the same cost and one good quality and smaller and the other bigger and lower quality, people will chose the bigger house"*. (Design Active worked on major housing

Participant C; *"…only one research to understand how occupants use the rooms effectively…"*

> *"Few years ago we were more traditional in design kitchen, living room and dining layout, we want to know exactly how occupants use these rooms and is it been using it effectively? And find a better way of doing it, we setup a project with Nottingham University, we built a more modern house in Sheffield called project life, we set a competition for a family to live in the house for 6 months, and we monitored them, then we knew exactly how they use the house and who is using which part of the house, then we discovered that the dining room where used very rarely, everyone eat in the kitchen, we also found that the kitchen is the Hub of the house, so we backed-up that theory and from that we changed the design of our houses to a more open plan family kitchen living use a lot more glass, bringing more light in, and bringing the glazed doors to the back of the kitchen so your doors open and to have your kitchen, dining and outside as well"* (Design Manager working for one of the major three housing developers in the UK).

Participant D; *"…No research or consultation of public undertaken to share end users view in the design process…"*

> *"The style of open plan kitchen dinning outside came from the 5 bed houses when you are expecting a large family and we replicated that in a 2 bed houses, if you look at the last 10 years houses you can see the change from a standard traditional layout to have these more combined multiuse spaces. No research or consultation of public related to design modern houses, we made many mistakes, such as building vertically high rise flats after the world war following modernism trend to house more families and it turned to be a huge social economic disaster"* (Technical Manager and member of the design team for major housing developers).

Participant E; *"…Not aware of any public involvement during the design process…"*

> *"Character and history of the area, sustainability and life length of building, suitability for end user (if end user if not client)"* (Architectural Technician design houses for a private architecture company).

Participant F; *"…this question is probably not the case with 'open market' sale houses as these require 'kerb appeal' for marketability…"*

> "*The key factors would be client briefing requirements and urban design issues (i.e. location, context, highways, etc.) Our clients are mostly Registered Social Landlord (RSL) organisations building affordable houses. They rely on Government funding to assist projects to be financially viable, and the products constructed are generally not 'open market' sale houses; rather, they are units for rent and for 'shared ownership' sale to eligible persons who otherwise cannot afford houses on the open market. There is generally a large shortfall of affordable houses. The above is probably not the case with 'open market' sale houses as these require 'kerb appeal' for marketability"* (Architect working for a chartered architectural practice, extensive expertise in housing sector and award winner of quality approach).

Participant G; *"…No research undertaken to investigate peoples need…"*

> *"Mostly we depend on the planning authority's requirements and we don't do any kind of research about people needs, it is more about market needs"* (An accredited SAP assessor and senior architectural technician working for chartered architects practice).

Participant H; *"…achieving planning authority brief is the target…"*

> "*Achieving planning authority brief is the target. The councils have their own data about the required type of the houses in the region and we do ask agencies about specific market demand*" (Developer & Maintenance Manager working for one of the leader developers in the UK).

Analysing interview answers for the second question which is about sharing peoples view while designing for new homes, shows that most of the participant agreed on the same point of not doing any kind of researches or survey to understand people views and requirements. Most of the developers depend first: on the planning authorities requirement such as density of housing per acre and type of the houses in term of numbers of bedrooms; second: is chasing the estate agent, property expertise and marketing companies to give advice on what kind of housing required in the area, because it is more about achieving numbers and coverage rather than design quality and high specification. Housing development is economically driven and as the market influence the process developers are not concerned about what peoples wants or invest more on the design quality and internal layout spaces, it is more about maximising unite production and achieve minimum building standards.

Architects and designers have a limited involvement in the design process, their role is more about alteration and making changes to the recycled and existing designs to fit the site and increase unit output. One of the large developers David Wilson Homes setup a research project with Nottingham University on 2007 to monitor the use of spaces by occupants which resulted in changing the traditional style of separated kitchen and dining room to an open plan kitchen-dining area, maximising the amount of glazing and provide glazed door at the back of the kitchen to bring outside in, all this done after realising that dining room wasn't used by the families and the kitchen was almost used as a living area. One limited research by one developer had a big impact on the way David Wilson Homes design their homes in the last seven years. This example can be used as evidence and justification for all UK developers to follow the same approach and start to involve more in consultation and researches about peoples view, behaviour and modern life requirements before building any development, which can have a huge positive impact on the way they design and build new houses, raise occupant's satisfaction and improve health and wellbeing.

To conclude, this section answered objective two of this study which is investigating whether designing small spaces and traditional design replication is driven by property developer's quest for profit or occupant's life style requirement, and participant answers outlined clearly that the government, local authority and developers are not involving public view in the design process, which means people needs and modern life requirement are not integrated in the design. Quest for maximising profit and market demand have the main influence on designing new houses.

Table 12: Traits associated with sharing end users view in the design process

Trait	Repeated Terms	Frequency
Survey Public Needs	No research or public consultation	8
Design specification	Only responding to Planning authorities requirement not public needs	8
Internal Space Design	Market need (Number of Bedrooms)	7
Form Design (House Appearance)	Developers choice	6

Looking at table 9, the entire participant agreed on that no research, survey or consultation took place, designing new houses is about increasing unit output to maximise shareholders profit and achieve minimum building standard to satisfy Planning Authorities.

Question 3: Participants were asked about the influence of the planning process on the design of new build houses. Planning process can be translated as local authority requirements and the required period starting from finding the site to the day of obtaining planning permission,

Participant A; *"...emphasised that planning process has a major influence on designing small narrow houses to achieve the required density and cover market demand..."*

> *"Planning process take up to 13 week period of designing, planning authority massively influences, is fundamental, The required density is influencing the design, Planning Policy Guidance 3(PPG3) came out at 2000, before that most of the houses were detached, then after PPG3 they started to encourage high density housing because of the massive population growth, this was the beginning of building narrow fronted tall houses to accommodate more people in a smaller area."* (Associate Director of an architecture firm)

Participant B; *"...planning policy massively impacted on housing density and as the production go up the quality go down..."*

> *"Planning policy massively impacted on housing design, it was the start of a three story house, small cheap high crumbed as much as possible, they can sell anything and give mortgage to anyone. Many terraces and few semi or detached, to provide affordable houses, now PPG3 is gone but still the impact is there in term of density, however replaced by MPPF which is a new policy it hasn't set any different. The only thing they did is not given the local authority the power and the quality gone down because Local authority doesn't have the power through planning policy to insist more on design quality, It is more about quantity not quality, so the developer build 100 units smaller houses instead of 80 units and less, the planning authority will encourage that, price will be lower because there will be no enough landscape and nice space, developers still make more money because they have 20 more units, they don't view it after they view as production, we are talking about high volume house developer (Barratt, Tylor Wimpy, Persimmon), then you have smaller developers like (Dived Wilson Homes, Bellway, Cala Homes) less volume and better quality, and they build in different areas, you find that as the volume go up the quality come down, Cala Homes builds larger houses with a higher spec, however Banna Homes bought them to double up their production, now they look at standardising their product to build more houses and this will bring the quality down because you use standard products. Spitfire Homes, is a good example of the other end of the scale they buy sites for no more than 25 houses they build mansion houses, 4-5 bedroom houses, they use designer kitchens and quality materials, their ethos is they designed well and build in higher quality materials they can sell at higher price, and because of that they can't go big, (AS PRODUCTION GO UP QUALITY GO DOWN)"* (Design Active worked on major housing projects).

Participant C; *"...Planning process have major influence on the design and councils are more about the number of output and percentage of bedroom numbers and they don't care about the size of spaces or layout of the house..."*

> *"Planning authority influence varies from area to area, we were lucky to have our architecture team in Leicestershire, so they designed midland style area, planning authorities has influences on the development layout more than houses layout, the most kind of forward thinking councils want more of the design, connectivity, and out looking development. So they are less concern about individual house types and individual rooms in a house, they want to create a place, councils are more about the percentage of 2beds, 3beds bungalows, and they don't care about the size of spaces or layout"* (Design Manager working for one of the major three housing developers in the UK).

Participant D; *"...it is more about development visual not internal layout of the houses or shape of individual houses..."*

> *"Unless you are building in a conservative are for example Georgian style area or there are stone houses then they ask you to build the same style. It is more visual not internal layout of the houses. As they say we are experienced house builders and that is our duty, some councils askes for the furniture to be added to the plans to check if a standard double bed will fit properly, we don't use undersized furniture in our show homes, and our senior director go to check the showrooms and make sure every furniture is the standard right size. We spend a lot of time to make sure that the spaces are functional"* (Technical Manager and member of the design team for a major housing developer)

Participant E; *"…councils concern is more about the output and developers can justify their design…"*

> *"How much influence does the planning process have on designing your properties? This depends on the area. If we are in a conservation area or upmarket area it is greatly influenced. Otherwise it is a factor, but the client has more guidance. I believe a design and access statement should be submitted for all type of planning applications, (not just listed buildings and conservation areas) so architects/designers can justify their designs".* (Architectural Technician design houses for a private architecture company).

Par *uch impact on the visual aesthetic appearance of these developments…"*

> "*Guidelines on planning, urban design issues and highways constrain the layouts and aesthetics of our designs, i.e. separating distances between dwellings to avoid or minimise overlooking, maintenance of building lines with adjacent land, expectations to develop massing and aesthetics that respond to and take cognisance of the surrounding context, requirements for highways accessibility, etc. Other planning considerations include local policies. In some instances, local adopted policies require the development to utilise non renewable energy sources which may include photovoltaic on roofs, necessitating taking this into consideration in the aesthetics. For social affordable housing, the planning process does not appear to have much impact on the visual aesthetic appearance of these developments."* (Architect working for a chartered architectural practice with extensive expertise in housing sector and award winner of quality approach).

Participant G; *"…Planning process has very limited impact on the design…"*

> *"the only time planners will be involved is when they ask for affordable or life time homes type, certain criteria apply by Housing Communities Agency (HCA), it is more about specifying these criteria, for example a kitchen might have a certain cubic capacity of storage, area of the kitchen should accommodate that capacity"* (An accredited SAP assessor and senior architectural technician working for

Participant H; *"…achieving planning authority brief is the target…"*

> *"How much influence does the planning process have on designing your properties? This depends on the area. If we are in a conservation area or upmarket area it is greatly influenced. Otherwise it is a factor, but the client has more guidance."* (Developer & Maintenance Manager working for one of the leader developers in the UK)

This question related to the role of the planning authority and the way they influence the design of new build houses. Constancy in the answers can be seen as the entire participant agreed on that the planning authorities massively influence housing development layout and density but have no influence on the individual house visual appearance or the design of internal spaces, it is more about achieving quantity not quality. Due to massive population growth Planning Policy Guidance 3 (PPG3) introduced at year 2000, it is a national policy and framework for town planning issued by the government and resulted in developing high density housing, this policy was the starting point for producing narrow front tall and cheap highly crumbed housing developments to accommodate more units on smaller sites, creating overcrowded unhealthy areas. However this became a trend for developers to gain more profit as instead of developing 80 houses they were developing 100 houses on the same plot of land. Replacing PPG3 with National Planning Policy Framework (NPPF) on 2012 didn't gave power to the councils through planning policy to consist on design quality and now councils are more concerned about the percentage of bedrooms numbers rather than house design or house quality, so it is more about quantity not quality.

In general planning authority is about the look and aesthetics of the whole development rather than focusing on design quality and layout of individual houses. Planning authorities have greater influence when building in conservative areas such as building in a Georgian style area where require using stone cladding to match the surroundings, it is more about aesthetic and visual appearance of the overall development layout not design quality of individual houses, table 10 shows clearly that all participant agree on that planning process is more about number of house production and type of houses in term of bedroom numbers, but quality of design not considered.

Table 13: Traits show the impact of Planning process on the space design and form design f new build homes in the UK.

Trait	Repeated Terms	Frequency
Planning policy impact	No direct influence on space design and form design	8
Planning policy requirement	More about quantity not quality	8
Planning policy concern	The overall development layout	6
Planning policy and public needs	Percentage of house type required by the market in term of number of bedrooms	4

Question 4: Participants were asked about the importance of design when designing for the rental sector or sale sector, explaining if the planning authority or developer have different design requirement in term of space or form of the house.

Participant A; *"…investing in design quality for sale sector is higher than rental sector…"*

> *"Rental sector for housing association is more space and lower quality, so public rental house quality is not high as sale sector"* (Associate Director of an architecture firm)

Participant B; *"…no investment in the design for public sector only for private rental sector coming in higher quality…"*

> **"** *(PRS private rented sector apartment scheme) coming in a higher quality, grand spaces in a way it should appeal to people and they never empty, and these houses are more sustainable and green due to longer interest investment , they don't make any more money from it, if you buy 25 houses to rent out for next 50 years and you have solar panel on it they pay for themselves and generating cash within the life time investment so the quality dose rate because it stand the test of time and have Constance appeal and could be rented all the time, also the if building is more sustainable it will be more financially viable for them long term, e.g. more heavily insulated homes means no boiler maintenance which benefit both the occupier and the landlord"* (Design Active worked on major housing projects).

Participant C; *"…No distinguish between rental or sale sector, same design used for both…"*

> "While we are designing, we don't distinguish between rental and sale sector, we treat them the same" (Design Manager working for one of the major three housing developers in the UK).

Participant D; *"…no difference between the designs for rental or sale sector…"*

> *"not now but in the future in 10 years' time we need to consider that as the price of houses getting higher it is difficult for people to buy, there are more people renting rather than buying, a lot of 20 to 40 years old still living in a home with their parents, as an industry we need to consider renting sector, it will be difficult to build and sell"* (Technical Manager and member of the design team for a major housing developer)

Participant E; *"…No difference between designing for sale or rental sector…"*

> *"From my experience, it tends not to make a difference. The only difference I've found is if it is purposely designed for a disabled person, then different regulations are enforced".* (Architectural Technician design houses for a private architecture company).

Participant F; *"…design quality is the same for both sale and rental sector unless it is specific requirement by the government…"*

> *"The following additional remark can be made: Government funding often necessitates adherence to the minimum space standard requirements of the Homes & Communities Agency (HCA), the Government body responsible for administering Government funding. This would be a condition of the funding. These space standards (Design & Quality Standards) tend to be a lot more than the standards adhered to by the speculative, open market sale, developers. Cost is of the essence to this (speculative) sector and they appear to work to the barest minimum standards"* (Architect working for a chartered architectural practice with extensive expertise in housing sector and award winner of quality approach).

Participant G; *"…same design applies for houses either for sale or rental sector…"*

> *"Nevertheless, though, recently national space standards have been advocated which will apply to all houses in the country irrespective of affordable or open market; hence, this difference in spatial standards between speculatively built, open market, houses and affordable houses may disappear"* (An accredited SAP assessor and senior architectural technician working for chartered architects practice).

Participant H; *"…No difference between sale or rental sector up to this point…"*

> *"The social, affordable, sector, in addition to conforming to the Design & Quality Standards of the Home & Community Agency (HCA), has tended, probably until now (as the Coalition Government attempted to steer the affordable sector into new ways of achieving financial viability for projects) to adhere to standards such as 'Lifetime Homes' which impose such requirements as ensuring there is a minimum path of 750mm around beds, making the room much bigger. With the new approach, however, more and more RSL clients are requiring non adherence to Lifetime Homes*" (Developer & Maintenance Manager working for one of the leader developers in the UK)

Analysing the answers given by experts about the way they design for sale or rental sector, there are no major differences between designing houses for sale or rental sector, the trend is building to minimum design and quality standards to achieve maximum profit. However building affordable houses for public is about more spaces, less quality and less cost, for private rental sector building better quality, more sustainable homes depend on the client's brief, some developers makes the house more energy efficient and viable for the landlord, on long term saving them money and more attractive for marketing to achieve better investment.

Other experts thinks that quality of design and spaces design for rental sector should be considered in the future, as the prices increase constantly it will be difficult to buy a house in the future, more people will rent than buying a house, and younger will stay longer in parent houses, which means developers will face marketing difficulties for selling what they build and market demand push them to invest more in rental sector.

Question 5: Participants were asked if in a more competitive market, design quality becomes a more important factor in marketing.

Participant A; "…Yes, if the cost of land reduced developers invests more on design…"

> **"***Yes, when people have more money they are willing to spend more money on buildings, IN EUROPE IS MORE ABOUT THE DESIGN OF THE BUILDING BUT HERE IS MORE ABOUT RECOVERING THE COST OF LAND. It is all about Land, our houses is the result of the competitive land, it is all about the bidding the highest for the land***"** (Associate Director of an architecture firm)

Participant B; "…In the UK it is about paying more for the land owner when developers make more profit…"

> *"In the UK because the land price is not fixed the more profit you gain the more you has to pay the land owner. So if the price of the properties goes up you have to pay more for the land owner. Everything is in the favourite of the land owner. So everyone is trying to drive down cost to achieve the land price"* (Design Active worked on major housing projects).

Participant C; *"…if more land released, price of land will come down and developers' can invest more on the design, create larger houses and well designed…"*

> "*We want to build more; all developers want to build more, but the planning authorities holding us back, they make it more difficult to get planning, releasing land, the rule of planning on a major application should take no more than 13 weeks from registration to approval and it is very rare, and normally from a site been discovered to a point of working on site across all BARRATT projects it will take 14 months*" (Design Manager working for one of the major three housing developers in the UK).

Participant D; *"…Releasing more land and reduce planning approval period is the key solution to have better houses…"*

> *"Discussion and approval with planning authorities take nearly a year, especially this year the election is coming and releasing land for developer is not a popular thing, most of the planning authority either deferral application or refused it, it is political agenda, the planning authorities not achieving their target and sometime they pretend they are doing well by counting the houses not been built yet"* (Technical Manager and member of the design team for a major housing developer)

Participant E; *"…it is about the number of rooms and not bout space layout or architectural aspects…"*

> *"This also depends on area. I believe for example, a central London resident would be more design conscious than a Bicester resident. Generally when it comes to modern housing, I think the spaces inside are the greater factor e.g. generally an ugly 3bedroom detached house with 2 reception rooms would gain more interest than a beautiful 2 bedroom terraced house with one reception room at the same price"* (Architectural Technician design houses for a private architecture company).

Participant F; *"…design quality is important only for private client…"*

> *"Definitely yes for open market sales, probably not quite so significant for the affordable rental sector"* (Architect working for a chartered architectural practice, extensive expertise in housing sector and award winner of quality approach).

Participant G; *"…land price is the key factor to build larger better houses…"*

> *"Land price is the main factor, trying to bring down all the costs to recover land price, and the long delay to get planning approval is another reason to be considered"* (An accredited SAP assessor and senior architectural technician working for chartered architects practice).

Participant H; *"…achieving planning authority brief is the target…"*

> *"Two reasons, land is very expensive and land price is not fixed, by the time you apply for planning approval land price will go up and you have to pay more for the landowner, sometime we do apply for planning approval for a number of sites at the same time, it will take a year or more to get approval, so for the sites we couldn't get approval all the cost and expenses will be recovered through the new project which been approved, which means customers pay fees spent for the rejected site"* (Developer & Maintenance Manager working for one of the leader developers in the UK)

Analysing Q5 answers, the high cost of land and not having fixed price for the land, considered as the two major factors affecting housing design in the UK negatively. However looking at the background of land price and none fixed price lands are: green belt regulation and difficulties of releasing land to build on, also delay by the planning authorises to get planning approval is another reason affected the design of new built houses. It is more about recovering the land price. Content analyses could be summarised as below:

- Building smaller houses, which means having more unit output to recover the high price of the land and achieve expected profit.
- Saving money through saving time to be spent on design process and recycle or reuse old designs with minimal alteration.
- Using same supply chain and same method of construction over and over to increase standardisation to keep the price down to minimum and maximise profit to recover land price.
- Building smaller houses means reducing internal space and designing inadequate space which is bad for health and occupant's wellbeing.

Table 14: Traits show the impact of land price on the design,

Trait	Repeated Terms	Frequency
Land price	Land price is high and should be recovered through building smaller houses and reduce investing in the design process	8
Saving money	Less investment in the design process	7
Market	It is more about the number of rooms not the architecture of the house or functionality of internal spaces	6
Building better houses	More land should be released and reduce planning approval period	4

Table 11 shows the frequency of answers 8 out of 8 agreed on that land price is the key issue behind the poorly designed houses and building smaller houses and maximise profit, 7out of 8 agreed on saving money on the design process give them the chance to pay higher price for the land and win the competition. 6out of 8 believe that market demand is about more rooms not the size of the house or the shape of the house.

Question 6: Participants were asked about the reasons behind including a limited number of modern style houses within a large number of traditional style houses.

Participant A; *"…it is required by Planning Authorities as a conditional offer to develop the site otherwise no volume developer want to build above the minimum standard…"*

> ***"****The planners have a requirement that 10% of the houses must be built in a specific way or it might be a public sector site then they let you to develop the site in a condition it has to be to be built to a certain standard. There are very isolated cases and it is very rare that you find a volume developer built above the statuary minimum, and at the moment buildings is guided by Building Regulation and Planning Policy. The demand for housing is so high, they don't need to build above minimum, and if people can get mortgages they can sell them any way so they don't need to do more (ABUSING THE HOUSING SHORTAGE)"* (Associate Director of an architecture firm).

Participant B; *"…it must be a condition of selling the sit or planning approval…"*

> *"Housing in Milton Keynes - code level 4 it has flexible adaptable housing which you can move walls and build extensions and loft conversions without any major construction, all the roofs are south facing to put solar panel on them all, trying to build robustness, because it is a public sector site when they sold the site these were the condition of selling the site (Conditional site sale by public sector). Knowing all the conditions in advance (10% use of renewable energy)So the developer bring the price of the site down to achieve the required policy, In the UK if you want housing quality you have to force the market to do it. Some academic research shows that in the English housing industry the environmentally sustainable application has a zero influence on the value. No evidence to show that influence"* (Design Active worked on major housing projects).

Participant C; *"…if more land released, price of land will come down and developers' can invest more on the design, create larger houses and well designed…"*

> "*If we build different houses such as Passivhaus or sustainable house it is because of a planning request, we have ideas to build more contemporary houses but the risk is that people aren't ready for it. We like to do it but the nervousness of the marketing team and us pushing it back, we build some 5 to 6 bedroom houses for peoples on high wages and older ages above 50s, we are always talking about it trying to do it, but still we are not sure, even we have some houses with traditional front but round the back more modern fully glazed, putting contemporary edge on the back of the property, it is more about mind se*" (Design Manager working for one of the major three housing developers in the UK).

<u>Sub question</u>: why you didn't build your own house?

> *"It takes a year to get planning approval, and price of the land, and mortgage difficulties. Land is very expensive by the time you secure the planning approval the price will raise more, difficulties to get mortgage for self-build, and I'm in the business but still scare and nervous about it. Grand Design program shows that always the house you build cost twice as much as you planned, make people more scared when they think these people they know what they are doing but still cost them twice as much as what should cost"*

Participant D; *"…since 1960s there was a void of design style and lost ability to create a new style, replicating houses built 300-400 years ago become the trend…"*

> *"The big question is why developers, builders and planning authorities encourage fake Tudor Victorian style and say that something built 300 - 400 years ago still is the right way to do it? Why we are not doing it at a more modern approach? Always we had styles we had Victorian houses, Georgian houses, Edwardian houses, early 20 Century houses, however since 1960s there was a void of design style and lost ability to create a new style, may be our new style will happen when there is more futuristic and more contemporary everyone is living in more glass steel houses with renewable advanced technology"* (Technical Manager and member of the design team for a major housing developer)

Participant E; *"…the authorities have approved small scale traditional style houses…"*

> *"I think on these occasions, the authorities have approved small scale traditional style houses as they believe it will make a low impact on the traditional area as a whole. I have lived in a development like this of just 6 houses and it was hidden up a lane out of sight from the passing public. (Google maps search 'Mayfield Mews, Oldfield Park, Bath)"* (Architectural Technician design houses for a private architecture company)

Participant F; *"…it is planning requirement and conditional offer for developers to have a few number of different style houses within a traditional style houses…"*

> *"Not applicable. This approach is unknown in our practice, as this implies mixing traditional with contemporary and we generally don't do this on the estates we design. However, there are instances where planning requirements on an open market development may require a proportion of units to be affordable. In such instances, two approaches are known: (1) The open market developer would identify a portion of land for affordable houses in order to meet this requirement or, (2) The development would be 'pepper potted' with affordable units among the open market sale houses to avoid distinction between the two"* (Architect working for a chartered architectural practice with extensive expertise in housing sector and award winner of quality approach).

Participant G; *"…the only way to change housing style is to be pushed by planning authority and building regulations…"*

> *"The users still can't understand these new technologies and the effective way of using it. We build a development with air source heat pumps, at the end the occupiers didn't use it efficiently so we had to put back electric boiler to keep everyone happy. The only way to change housing style is to be pushed by planning authority and building regulations, as a business we target the minimum"* (An accredited SAP assessor and senior architectural technician working for chartered architects practice).

Participant H; *"…housing shortage is the reason behind adapting new house style…"*

> *"Because of the housing shortage it is difficult to jump to these new technologies and these new ways of building houses, now a house takes 16 weeks to build and with these new technologies it takes 25 weeks which means slowing down the building process, and also raise the cost, solar panel is still expensive and may be in the next 10 years prices coming down and it will be more effective*" (Developer & Maintenance Manager working for one of the leader developers in the UK).

Analysing the answers of question 6 underline that the approach of including a limited number of modern style houses within a traditional development directly related to either planning authorities or public sector requirement, this was the shared point among all the answers. Developer looks at housing development as any other business and achieving minimum regulation and planning standards is the target, it is very rear to find a developer build above statuary minimum.

High demand in the housing market is one of the key factors lay behind developers don't need to build above minimum standards; abusing the housing shortage, it is more about achieving quantity not quality. According to some academic researches environmentally friendly and sustainable application has no influence on the marketing values, no evidence to show that influence.

For a developers a traditional house normally takes 16 weeks to build, if they include new technologies or changing construction method it takes 25 weeks which means slowing down building process, so time and cost will be affected and reduce developer's profitability. Other reasons related to end users when providing modern style housing, lack of knowledge by the occupants to use the integrated technologies and the fear from changes which can be translated to mind set is other factor encourages developers to keep replicating traditional design and achieve easy marketing. During the interviews two examples from real life projects have been introduced by housing experts one of them is the development by David Wilson Homes with air source heat pumps, after one year the occupants couldn't use it efficiently so they had to reinstall the standard system for them, and the second example is the development in Mayfield Mews in Bath, which they built only 6 modern style houses in a large traditional style development, the 6 houses were built in an area hidden from sight of passing public, the justification behind providing these 6 houses was to lower the impact of housing on the environment. To conclude; optimising housing design should be pushed by the Planning Authority and Building Regulation only.

Question 7: Participants were asked about the small size of new home garden and if small garden is an advantage in selling houses,

Participant A; *"...Big gardens considered as a waste..."*

> ***"****still developer use a 21 meter back to back distance rule to provide efficient gardens, that generate a 10.5 meter garden, bigger than that considered as waste, only who expected to pay a lot of money for a big house expect a big garden and a big garage, Agent report show the market is well proportioned as the market goes up the rooms get bigger, which impact on the hallway, the garden and the garage get bigger, in the city centre big garden could be a good selling tool and advantage for the house, in countryside it is not a very valuable tool"* (Associate Director of an architecture firm).

Participant B; *"...Big garden is not necessary now..."*

> *"The size of old houses big garden came from the idea of growing food. People who buy new build properties they know what they will have is a 10m length back garden, their mind set tell them it is enough for barbeque enough for small planting"* (Design Active worked on major housing projects).

Participant C; *"...for every extra meter you give for the garden you loss a house somewhere down the run, it is counted as waste of money..."*

> "*People realise that if the buy a new build house they will get a small garden, because land is expensive, and going back to minimum set by building regulation 21meter back to back regulation, for every extra meter you give for the garden you loss a house somewhere down the run*" (Design Manager working for one of the major three housing developers in the UK).

Participant D; *"…extra meter to be given to the garden means less output…"*

> *"Yes we are in a business of building homes for people but also we are in a business to make money for our shareholder to consider. We can't give extra meters for the garden as we wouldn't win the site and another developer will do"* (Technical Manager and member of the design team for a major housing developer)

Sub question: but 21 meter back to back regulation doesn't exist anymore, so why still you are applying the rule of 21m back to back?

> *"Because the planning authority still does, Warwickshire council stick to it rigidly, it is related more to price of land and local planning requirements*"

Participant E; *"…No it is not necessary option for a house…"*

> *"No, but some people accept it as they feel they have no choice if they have a new build"* (Architectural Technician design houses for a private architecture company)

Participant F; *"…small garden cost less for maintenance…"*

> *"No. It really depends on an individual. With starter homes lived in by perhaps a single person household, a small garden might be preferred because there is less work in maintaining it. This may not be true for large families."* (Architect working for a chartered architectural practice with extensive expertise in housing sector and award winner of quality approach).

Participant G; *"…large garden is not important, it needs money and time to maintain…"*

> *"No, people looks for larger internal spaces, a small patio for barbecue and small planting area is what they need; large garden needs money and time to maintain"* (An accredited SAP assessor and senior architectural technician working for chartered architects practice).

Participant H; *"…Large garden doesn't add value to the property…"*

> *"Small or larger gardens doesn't add values to the property, small gardens are more manageable and cheaper to maintain*" (Developer & Maintenance Manager working for one of the leader developers in the UK).

Clearly participant answers shows that, size of the garden has no value or adding no value for developers and cannot been used as a marketing tool. Still developers and councils use the 21 meter distance back to back rule despite the fact that the rule doesn't exist anymore and has been removed from Building Regulation. Historically the size of old house gardens was large to encourage growing your own food. People mind-set tells them they will have a 10 meter small garden when they want to buy a new build house. Developers think that people wants small garden easy and cheaper to maintain.

The price of land is very expensive, adding an extra meter to the gardens means losing a house somewhere downs the run which means another developer could win the site as they have more unit output, so again it is more about quantity not quality and on the other hand as a business having more unites on the site makes more money for the shareholders. Having a small garden means noise and overlooking which could lead to conflicts with neighbours, "Poor Design" forced developing cramped neighbourhood.

Question 8: "…participants were asked about if designing narrow houses give them a better use, more efficient and more economical roads and drainage or help them to achieve the required density…"

Participant A; *"…narrow houses give developer more unit output…"*

> ***"****If you have the design narrow you will have the garden narrow plus applying the back to back rule, no one has a requirement on the width of the garden, if you increase the width of the garden then on the same piece of land you will have less houses, with narrow front houses the street looks a car park"* (Associate Director of an architecture firm).

Participant B; *"…narrow front house is about producing more houses, the negative consequences of narrow frontage is not important for developers…"*

> *"Some local authorities have design guides with wider house design, but if not guided they don't care if you have a problem with your neighbour for car parking; they care about if you have a shower licking"* (Design Active worked on major housing projects).

Participant C; *"…it is more about number of bedrooms not size or shape of the house…"*

> "*Yes, still that is a standard models from Victorian, money lenders don't care about how wide or how narrow is the house, it is more about numbers of the bedrooms*" (Design Manager working for one of the major three housing developers in the UK).

Participant D; *"…what are important are how many bedrooms…"*

> *"what is important is how many bedrooms, wide or narrow front doesn't make any difference for marketing and at the same time we provide more houses on the same plot of land"* (Technical Manager and member of the design team for a major housing developer)

Participant E; *"…narrow front houses mean more unit output and more profit…"*

> *"It is about achieving the required density and achieving maximum profit"* (Architectural Technician design houses for a private architecture company)

Participant F; *"…it is about achieving efficiency in numbers relative to land cost…"*

> "Yes, depending on site configuration. It tends to be the case that our clients require our designs to optimise the site to achieve efficiency in numbers relative to land costs and project financial viability. Narrow houses can do this quite well if the site shape and wider context allow" (Architect working for a chartered architectural practice, extensive expertise in housing sector and award winner of quality approach).

Participant G; *"…it is about achieving quantity not quality…"*

> *"It is about achieving quantity not quality, with narrow front houses you can fit more houses on site and make more profit"* (An accredited SAP assessor and senior architectural technician working for chartered architects practice).

Participant H; *¨…achieving required density and make more profit…"*

> *"With designing narrow front houses saving in construction time, materials quantity and planning authority density requirement can be achieved*" (Developer & Maintenance Manager working for one of the leader developers in the UK).

To conclude designing narrow front houses is coming from the Victorian housing era. As there are no minimum space standards and a money lender doesn't have any restrictions on how wide or narrow are the houses. Developers build terraced narrow houses to achieve maximum profit and the density required by planning authority. It is more about number of bedrooms and not about design or layout of the house. With designing narrow front houses developers save construction time, save money on quantity of materials which result in building more units on the same plot and making maximum profit is the target. Compromise the design to achieve quantity not quality.

Question 9: Participants were asked about the factors drive the design of new houses in the UK,

- The market
- Housing shortage
- Materials cost, availability and standardisation
- Planning authority's requirement
- Practicality
- Energy efficiency
- Economic
- Other factors (give examples)

Participant A; *"…economic and housing shortages are the key factors drive the design of new build houses…"*

> **"***Economic which is land price; housing shortage is coming as second influence, however the developers they don't want to supply enough houses, the more you supply the price will go down, they want to keep the demand gap to sell anything they build"* (Associate Director of an architecture firm).

Participant B; *"…Economics and Market demand are the key factors affecting design …"*

> *"Economic and marketing are the main key influences the design and the main drive for designing new build houses"* (Design Active worked on major housing projects).

Participant C; *"…housing shortage and marketing have the major influence on the design process…"*

> *"housing shortage is coming first, the market, planning authority; materials cost (shortage of brick and timber) Brick supply changed from 2 weeks to 30 weeks, difficulties to find a brick layer, shortage of skilled full labour, in 2008 the market collapsed and all the skilled labours went to other industries and now the market recovered and difficult to find skilled labours*" (Design Manager working for one of the major three housing developers in the UK).

Participant D; *"…Market has the main influence on the design…"*

> *"market has the main influence for us, we have a capacity of 800 houses with the number of houses we have more than that it will be difficult to control"* (Technical Manager and member of the design team for a major housing developer)

Participant E; *"…economic, housing shortage and government housing density has the main influence…"*

> *"Many factors affecting the design of new build housing, the housing shortage and housing density coming first then other factors such as materials cost, availability and standardisation and energy agenda impact the design as well"* (Architectural Technician design houses for a private architecture company)

Participant F; *"…economic is main drive of designing new build houses…"*

> *"Materials cost, availability and standardisation is a significant factor. The other factors listed also all play a part as design is a dynamic process*" (Architect working for a chartered architectural practice with extensive expertise in housing sector and award winner of quality approach).

Participant G; *"…housing shortage and economic is the drive…"*

> *"Housing shortage, secondly land price and material cost."* (An accredited SAP assessor and senior architectural technician working for chartered architects practice).

Participant H; *"…housing shortage and economic have the main impact on housing design…"*

> *"Housing shortage, economics, others such as housing density have the main impact on the design of new build houses"* (Developer & Maintenance Manager working for one of the leader developers in the UK)

Pattern through the answers is very clear. The entire participant agreed on housing shortage, land price and density requirement drives the design of new build housing in the UK. Housing shortage and gap of the demand encouraged developers to focus on quantity and not design quality as they know that they can sell anything they produce, peoples left with no choice and the houses they build is the only one in the market. Second factor is economics which is affected mainly by the land price, it is too expensive, the only way to recover price of land is through building smaller houses to produce more units and save money on the design process through recycling old traditional designs. Third factor is achieving planning authority density requirement through building smaller houses and building more unites on the same plot of land. Developers can build more houses to close the gap of demand however more you build, the price will go down and keeping demand gap will keep the price up and create easier marketing.

Question 10: Participants were asked to outline the way increasing importance of the energy agenda impacted on design quality,

Participant A; *"…Energy agenda has no impact on the design of new houses, it is more about quantity not quality…"*

> **"***No, environment efficiency doesn't count at all, because they look for volume not quality, developers build code 3 or no code and they scraped code 6 sustainable homes, and it will go inside of Building Regulation"* (Associate Director of an architecture firm).

Participant B; *"…energy agenda has no impact on the design process…"*

> *"All the practises of brick and block work they can't achieve code 6 or even 5, may be it can be done if you they stop brick and block houses and use a more standard contemporary style then we can drive innovation in the design world, a new design which is new and not done before and it will become normal after that***"** (Design Active worked on major housing projects).

Participant C; *"…energy agenda has no impact on the way we design, we continue building in a traditional way…"*

> *"It is add to the cost, you should be careful what to provide, we should been in the stage of carbon emission couple years ago but never we achieved it, I can see we will continue the way we do for a long time, with 2013 Building Regulation we are meeting the standard and we will continue and the next step is putting solar panels on the roof one after one where we get to a point we realise it is not right*" (Design Manager working for one of the major three housing developers in the UK).

Participant D; *"…energy agenda can't be achieved and has no impact on the design process…"*

> *"We can't achieve the energy agenda because we can't expand more from 280mm wall now it is 300mm, that affect the design of the houses as the land is very expensive, on a long row of houses you will loss 2 to 3 meters, time for change is not coming yet depend on the part L and the new set of building regulation upgrade and the new governments requirement"* (Technical Manager and member of the design team for a major housing developer).

Participant E; *"…due to lack of knowledge energy agenda not affected new housing design yet…"*

> *"Yes, but I believe there is little knowledge about what we can do and it will take time and education before it makes an impact on all new housing"* (Architectural Technician design houses for a private architecture company)

Participant F; *"…economic is main drive of designing new build houses…"*

> *"I don't. I cannot see the energy agenda impacting aesthetics, internal room layouts, site layouts, etc. But I do see it impacting technical issues, i.e. thicker walls, improved thermal comfort, etc*" (Architect working for a chartered architectural practice, extensive expertise in housing sector and award winner of quality approach).

Participant G; *"…energy agenda has no direct impact on the design only used as a marketing tool…"*

> *"Not direct impact sometime used as a marketing tool"* (An accredited SAP assessor and senior architectural technician working for chartered architects practice).

Participant H; *"…no impact on the design…"*

> *"As it is not adding any value to the houses we have to be careful where and when to use these technologies"* (Developer & Maintenance Manager working for one of the leader developers in the UK)

Analysing the content of answers given by experts, Energy agenda doesn't impact on designing new build houses as all developers build to minimum standards and achieving energy agenda such as code 5 or code 6 is almost imposable with the brick and block technology unless we optimise the design of new housing and use a more contemporary construction method.

All this will add to the cost of building new houses but not adding to the marketing value. Achieving energy agenda has technical issues such as requiring thicker walls which means either reducing the internal useable area more or increase the external house area which affects the number of houses produced on the site.

Question 11: Participants were asked to explain if meeting minimum Building Regulation is the drive or target and if there is any incentive to build above the Building Regulation specification,

Participant A; *"…achieving minimum Building Regulation is the target, no planes for building above the minimum standard…"*

> ***"****No, only if it is required by public sector or planning policy, or develops for a private rental sector to invest on a long term base, it is a statuary minimum to cost less****"*** **(Associate Director of an architecture firm).**

Participant B; *"…achieving minimum is the target…"*

Part *"Unless it is not required by planning authorities achieving minimum is the target****"*** (Design Active worked on major housing projects).

> *"It is achieving statuary minimum to cost less*" (Design Manager working for one of the major three housing developers in the UK).

Participant D; *"…comply with minimum standard is the target…"*

> *"Building Regulation set the minimum target and we comply with minimum standard. We make sure to build to the current regulation when there is a change or upgrade to the regulation. you can't get the full value when you integrate technology, the cost of solar panels you never get the value back at the end of purchase, some like it and some not and ask us to remove it"* (Technical Manager and member of the design team for a major housing developer).

Participant E; *"…client wants to achieve minimum requirement and maximise profit…"*

> *"This depends on the practice attitude and the client. If the client is the end user, there is more chance that they will want to achieve a better result, if they are doing it to make money; they usually wish to achieve the minimum requirements"* (Architectural Technician design houses for a private architecture company).

Participant F; *"…achieving minimum requirements is the target…"*

> *"Generally, there is no incentive to build above the minimum building regulation standards. However, improved thermal performance in new houses is a sales factor, i.e. end user enjoys energy savings*" (Architect working for a chartered architectural practice with extensive expertise in housing sector and award winner of quality approach).

Participant G: *"…achieving minimum standard is the target and the drive…"*

> *"Sticking to minimum standards is the drive and the target"* (An accredited SAP assessor and senior architectural technician working for chartered architects practice).

Participant H; *"…no impact on the design…"*

> *"Unless it is not required by planning authority achieving minimum standards is the target"* (Developer & Maintenance Manager working for one of the leader developers in the UK)

Constancy among the answers is very clear; all developers build to minimum standard and specification unless it is required by the planning authority or Building Regulations. It is all about quantity not quality. Building above the required specification needs adding to the cost and time and it doesn't add to the marketing value and due to demand gap in housing market, developers can sell any house they build, so achieving minimum standard is the trend.

Question 12: Participants were asked about the back ground of team members involved in designing new houses for volume developer,

Participant A; *"…no architect involved in designing houses for volume developer…"*

> ***"****If it is a bespoke housing development there is probably an architect involved, but most of the volume development not using architect for designing their homes"* (Associate Director of an architecture firm).

Participant B; *"…no architects involved, mostly are technicians or Architectural Technologist…"*

> *"More of them they have design team and mostly they are technicians or Architectural Technologist but not architects, we are planning to build new houses last for 300 years* (Design Active worked on major housing projects).

Participant C; *"…In house group design team, architect and architecture technologist are responsible for designing new houses…"*

> *"All our houses designed by In house group architect, the architecture technologist also involved in the process. It is more about the mind set and both developer and people are scared from change, waiting for who do the first jump, we must adapt contemporary living, the last two generation were too similar, but with the next generation there will be a natural move*" (Design Manager working for one of the major three housing developers in the UK).

Participant D; *"…we have a core design range which we are allowed to modify…"*

> *"We have the core group design; they set a core house design type and the head of that group is an architect, the architect is the base of our design, but we have a core design range which we are allowed to modify, change and adapt to fit to the local setting that required, we all involved with the design of houses, I have changed and adapted most of houses to fit the area changing walls changing positions, the core range designed by architect and all the technicians all involved to adapt coordinate and sometime using outside consultancy as well, planners as well, we have our technical and design department"* (Technical Manager and member of the design team for a major housing developer).

Participant E; *"…new houses are designed by contractor or developers…"*

> *"This depends on the scale of the job. Generally from my experience the small scale jobs (one off houses, extensions, small developments (less than 10 houses) is designed by the architects, designers and technicians. The large scale developments (regeneration, large developments) are designed by contractor/developers"* (Architectural Technician design houses for a private architecture company)

Participant F; *"…Architects and Architectural Technologist…"*

> *"Architects and architectural technologists*" (Architect working for a chartered architectural practice, extensive expertise in housing sector and award winner of quality approach)

Participant G; *"…a design bank which could be altered and change to fit the site…"*

> *"We have a design bank which could be altered and change it to fit the new development and requirements"* (An accredited SAP assessor and senior architectural technician working for chartered architects practice).

Participant H; *"…modify the existing design and adapting it to fit the new site…"*

> *"Mainly designed by architects and architectural technologist and technicians modify the existing design and adapting it to fit the new site"* (Developer & Maintenance Manager working for one of the leader developers in the UK)

According to the expert's opinions most of the developers have a bank of designs which already designed by architects and will be recycled and modified by architectural technologist and technicians to fit the new development and comply with the new requirements. Each project is a unique project and has different requirements, however architects has a limited involvement in the design, and it is more about recycling old design and make some changes to fit the site, which means replication of the same design everywhere in the UK.

5.3.1 Chapter Conclusion:

It is not housing builders' fault, they are responding to the market, planning policy and building regulations. Similar to any other business house developers try to make maximum possible profit. London Planning Authority has design standards regulation, minimum space standards regulation, cycle storage, bonus points for building above minimum statutory (which is code 5 and 6), and if the Government specify these requirement nationally, the house developer will respond. They dislike it but they have to follow and respond to the standards and regulations. Unless someone tell developers what to do they will continue and go for the cheapest option and achieving minimum standards will be the target. One of the biggest problems is the green belt and many people at the bottom of the ladder they don't want you to release any extra mile outside the green belt zone, first; because of building on green country side is not preferred option, secondly developers want to keep the high value.

If instantly supply of houses increase, value of all properties will come down, so this will create more problems. Optimising housing design is a safer option to keep the price level and tackle the housing shortage. Other options such as salary rise could help, but it is massive disaster if houses loss value. Developers are worried for how they buy the land not how they build it, so cheaper land price could allow developers to invest more on the design quality and create larger and better spaces.

In Europe developers are worried for how to make houses look better. Fixed land price is the solution, nothing beyond that, if developers have a 10 year development program you invest the increased value of houses on the design quality but in the UK it goes to land owners. Encouraging self-build, UK Government can support public to build their own houses and invest more in the space and layout design is another option to look at, but again the land price will create implications. Other suggested solution is providing fixed price plots for individuals to build on within a regulated frame standard and regulated parameter could encourage invest more on the design quality. It is very important to have a **National Minimum Space standard** and **National Design Standard,** so everyone can comply and adapt the standards. Developers will respond to these standards if it is required by Planning Authority and Building Regulation, which results in pushing developers to invest more on the design process and find other method of construction to achieve energy efficiency which leads to developing more modern style of housing.

We must ask why houses in more demand in the UK than elsewhere? Demand forces that. Change should start from parliament fundamental rules, building a new garden city, release more green lands and compulsory price on the green land to have a fixed price for plots could result in providing new models of housing; however, this solution will create a large market and may influence on the existing land market and help bringing down the price of houses in the future.

5.4. Visual Analysis

5.4.1. Introduction

As discussed earlier in the methodology chapter a mix of qualitative and quantitative approach have been adopted for this study, another way to reinforce the qualitative approach will be through visual analysis, collecting brochures, taking photos, access online sources to identify constancy among different developers comparing different new houses in different locations in term of layout design. This method require gathering and examine relevant information about new housing development to look at constancy in the housing design, understand the rationale behind replicating similar house design by different house builders, despite the fact that every single construction project is a unique project and has its own implications and requirements.

Life style has changed dramatically in the last 15 years; however developers still replicating traditional old housing designs which designed for a different purpose and different life requirements. For this study brochures samples selected from three largest housing developers in the UK: Taylor Wimpey, Barratt and Persimmon Homes. They are the leading house providers and they have the main influence on the housing market. Collecting brochures and access their websites to look at variety of housing design images to find constancy among the sample and prove the poor investment in the design quality.

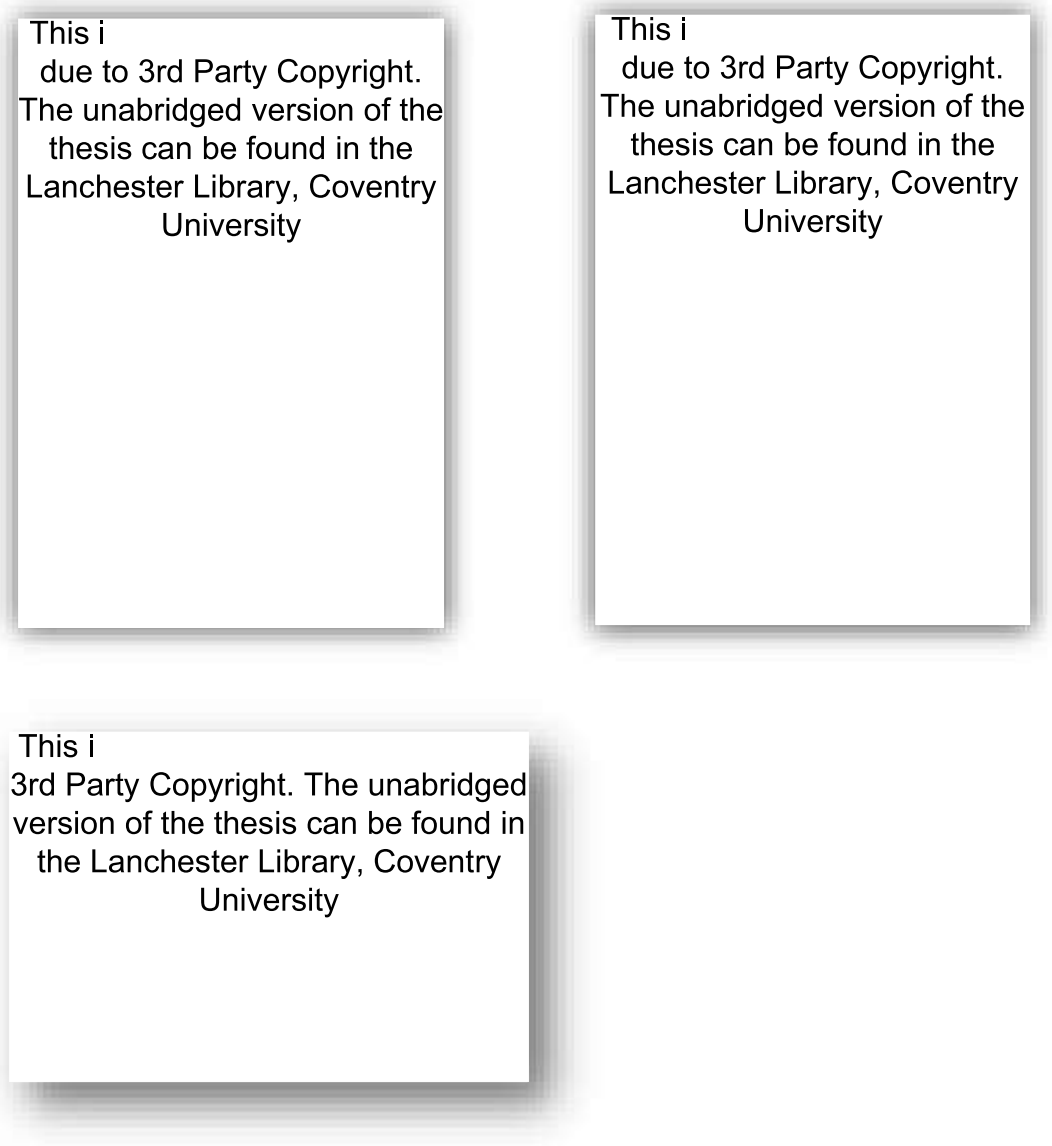
Table 15: Major housing developers in the UK 2006 - 2015 (brand-newhomes 2015)

This section examines the lack of investment in the design through analysing a number of selected sample images designed and built by the same developer in different locations, and models designed and built by three different developers and located in different locations within the UK. The similarity in designing layout and appearance using same materials, same shape, same number of doors and windows, can evidence the poor investment in the design. Samples of developer's broachers can be found in the appendix 7.1.4

5.4.2 Analysing different houses designed by the same developer

Figure 19 shows one sample of many house images from official Taylor Wimpey brochure showing three houses designed and built by Taylor Wimpy in three different locations in the West Midlands, they are four bedroom houses. Similarity in the design is very clear in term of layout design. Every construction project is a unique project, it has it is own specification and requirements, recycling same design on every site and in different location show the poor investment in the design aspect.

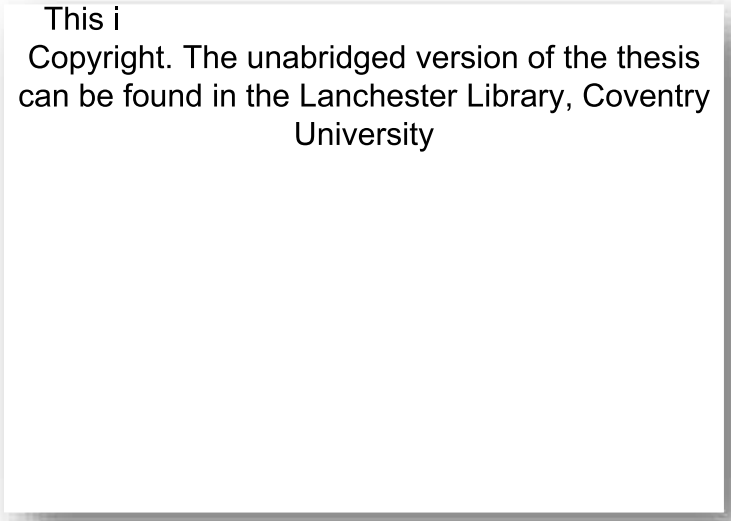
Figure 19 Houses for sale ((Taylor Wimpy 2015)

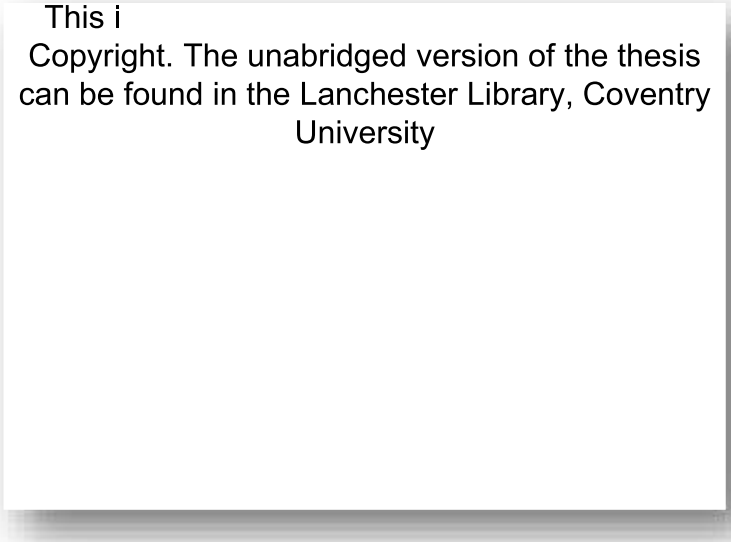


Looking at the three houses, replication of the same design could be seen clearly, considering the details different door porch canopies, different type of windows or different colours brick have been used to create differential in appearance.

Figure 20, a 4 bedroom house shows the same design to the previous houses but with one blocked window which can be seen in many locations within the UK. This is counted as a design mistake and proves the adaptation of a recycled design and forcing adjustment to the new location without taking the context in to account. Poor design quality

Figure 20 Houses for sale (Taylor Wimpy 2015)

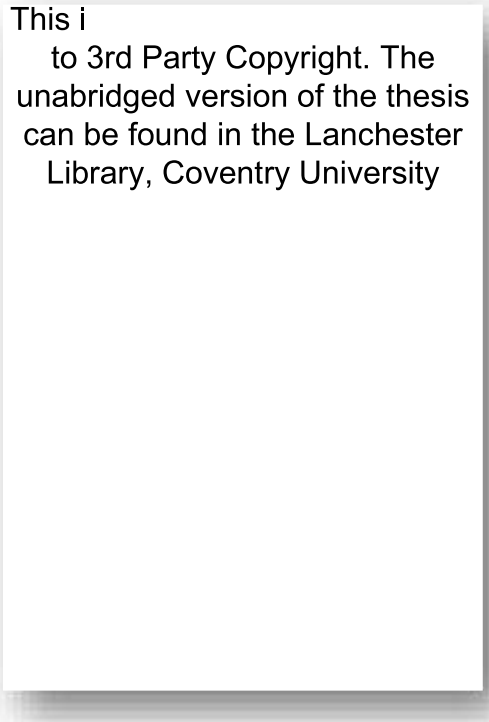


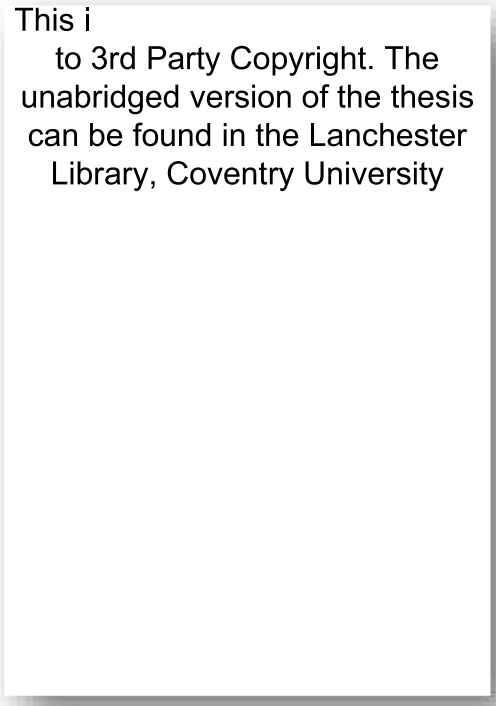


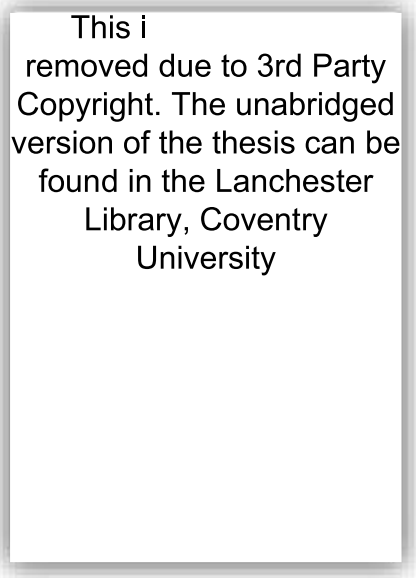
5.4.3. Analysing different detached houses designed by different developers

Figure 21 shows three different houses designed and built by three different developers, in three different locations. Similarity in the design is very clear in term of layout design, again it proves the poor investment in the design and the gap of architectural style can be recognised.

Figure 21 Houses for sale (Persimmon, Barratt and Taylor Wimpy, 2015)







5.4.4 Analysing different terraced houses designed by different developers

Terraced houses designed and built buy the same developer in different locations, replication of the design in term of layout design can be identified clearly, however different window style, size and different door porch used to play with appearance. These images can show the poor investment in the design and clearly shown that developer looks at houses similar to any other product, it is more about mass production, despite the fact that:

- House is the most life change and expensive product we ever buy
- Each site and project has it is own unique specifications and requirements
- Micro climate is different from an area to another
- People, culture and tradition in different areas have different requirements and needs

Semi-detached houses designed and built buy same developers in different locations

Figure 22 Houses for sale (Taylor Wimpy, 2015)

This i
Party Copyright. The unabridged version of the thesis can be found in the Lanchester Library, Coventry University

Semi-detached houses designed and built buy different developers in different locations

Figure 23 Houses for sale (Persimmon and Taylor Wimpy, 2015)

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due to 3rd Party Copyright. The unabridged version of the thesis can be found in the Lanchester Library, Coventry University

Row of terraced houses designed and built by three different developers in three different locations

Figure 24 Houses for sale (Persimmon, Baratt and Taylor Wimpy, 2015)

5.4.5 Comparison between old and new built houses

Figure 25 Houses for sale (Google images 2015)

Terraced housing, Hall Green Medows

West London 2015

Terraced housing in Bury 1900

Figure 25 shows the clarity of design replication in the last 100 years despite the fact that modern life style and people's needs changed dramatically, but the mind-set drive developers to recycle old designs with minor alterations and adaptation to fulfil the new site.

Looking at the details of these houses new and old, replication can be recognised easily, even roof windows or some architectural feature such as the door arch detailing have been replicated.

Figure 26 Old vs New Houses (Google images 2015)

5.4.6. Conclusion

Carefully selected samples have been analysed to identify housing design constancy through decades in term of layout design and some detailing features. The purpose behind this analyse is to prove the poor investment in the design by the developers, showing evidence of recycled designs used by different developers and replicated in different locations over and over. For this study, three major developers selected to compare layout design. First section is about comparing houses built and designed by the same developers in different locations, second section is about comparing different houses built and designed by different developers, and the third section is about comparing new built with old houses. As a result of this comparison replication of old designs and using recycled design could be highlighted clearly and developer's poor investment in design has been proven. Optimising housing design in the UK become necessary and unavoidable, despite the fact that modern life requirement and people needs changed dramatically in the last 15 years, however developers still replicating traditional design been designed and constructed for different life requirements. Replicating layout design is one of the key reasons behind people lost interest in the new build houses which have negative impacts on the construction industry, economy and future of next generation.

5.5 Questionnaire analyses

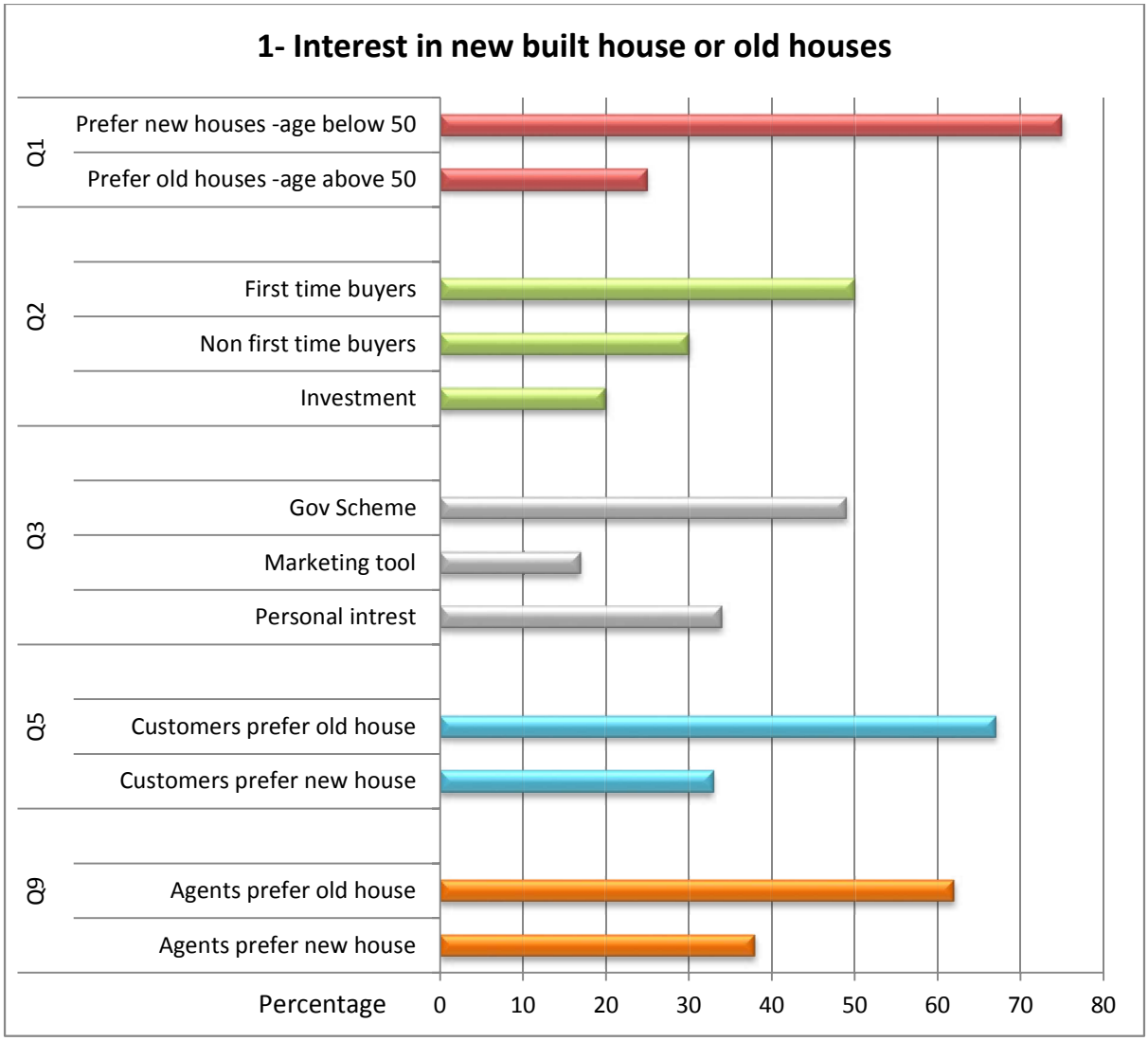
5.5.1 Introduction

As mentioned in the previous methodology chapter, qualitative data is the main drive of this study, however Quantitative methodology adopted to test the internal reliability and understand the behaviour of the data, this method is more dependable and objective (Lewis S & Thornhill, 2007). A well detailed semi closed format questioner provided to collect a survey data from different estate agents in different locations such as Coventry, Croydon, London, Birmingham and Leicester. Survey outcomes used to measure the last objective of this study to validate research findings and quantify estate agent's opinions. Out of 50 questioners 21 completed questioners returned, each questioner consists of 11 multiple choice questions with option of writing extra comments to reinforce their answers. Inferential and descriptive statistics available to draw a conclusion from the outcomes, however, due to the limitation of the collected data and the need to obtain a simple summary to underline the key points using bar chart, this format has been designed to produce a Descriptive Statistics, so the generated numbers can be used to describe and draw a conclusion from the information collected from the questionnaire using percentages, make performing preliminary analysis easy and clear (Saunders M, Lewis P, Thornhill A 2007). Targeting estate agents is very important for this study to address the problems associated with the new built houses, as they are experts in selling or renting houses to the public, also they are the active link between housing developers and the end users, which mean they are aware of occupant problems and needs, they are the right people to highlight most of the design problems associated with new built houses as they obtain the feedback from end-users. Each question prepared carefully to address the main issues related to space design and layout design. Last section of the questioner consists of three questions related to estate agents personal view as an expert working in the house marketing. Their view is extremely important, in addition to their expertise, they experience many houses on a daily bases, which means they have a better chance to find the best deals for themselves.

Due to use of paper questioner and use of different style questions, responses transferred manually to the spreadsheets, each question and answer given a code, details can be found in the (Appendix A2), then adding the response codes together using filter to each response and calculate the percentage of participants agreed on the same key points such as small spaces and layout design, using sub samples to understand the main samples.

5.5.2 Questions 1, 2, 3, 5 and 9 analyses

This section analyses and interprets the data generated from the questioner, describing Estate Agent's view which reflects the feedbacks they obtained from the customers or end-users. The Bar chart below shows the results from analysing grouped questions (Q1, Q2, Q3, Q5 and Q9) because the participants were asked five different questions deploy under the same theme which is about their personal and their customer's interest in a new built house, the results can be summarised as below:



Results from analysing the first three questions (Q1, Q2, and Q3) shows that; younger generation and first time buyers prefer to live in a new build house and one of the main reasons according to the bar chart and written comments on the questioner is the government's help to buy scheme and marketing tool to help first time buyers to jump on to the home ladder. The scheme is offering a payment of 5% deposit of the 75% of the house price and 25% will be paid by the government. This scheme is only for newly built houses with a price tag of up to £600,000, you can't apply for the scheme when buying an old house (HM Government 2017).

As the bar chart shows, marketing tool by the developers such as offering choice of flooring, kitchen or offering a new car included within the mortgage scheme is another reason pushing younger generation and first time buyers to invest in new build house. So they left with no choice and buying an old house could be very difficult.

Without the government's scheme and marketing tools, developers could face marketing difficulties for their new built homes which will have a negative impact on the national economy.

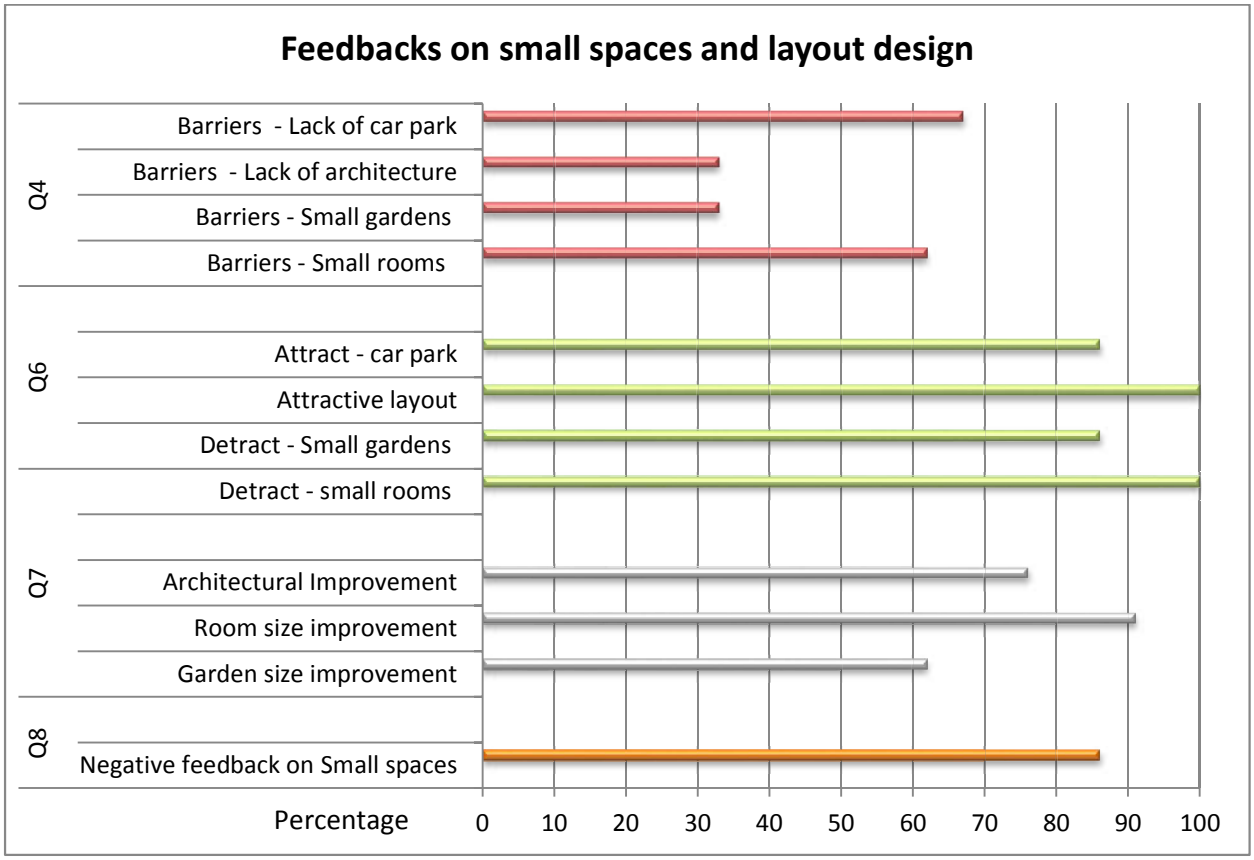
Question five (Q5) which is again supporting the first three questions is about the preference of living in an old house or a new house. Results show that 67% of the people prefer to live in an old house. This percentage support RIBA's survey on 2013 which showed that; in the UK only 1 in 4 people wants to live in a new build house, these results means there are something wrong with the new built houses, otherwise the logic is; everyone prefer to obtain a new product, especially when we come to a house which is the most life changing and most expensive product we ever buy, so investing in a new house should be the target for everyone, however in the UK we can see that most of the people prefer to buy or rent an old house.

Answers from question nine (Q9) which is again about the interest of living in a new built house or old house, but this time the question is targeting the agents themselves, their personal decision, as they are experiencing many houses for sale or rent every day, their experience and skills could help them to choose the best house for themselves. However the bar chart shows that 62% of the agents live in an old house. Checking the answers asking the others why you chose to buy a new house, most of their response shows that the government's help to buy scheme was behind their decision and if they have given the choice they preferred to have an old house for many reasons addressed in the question ten (Q10). Lack of government's scheme for old houses prevented some agents to buy or rent an old house. Comments from some of the agents who ticketed the box of living in new built house evidence this case *"I'm living in a new built house but I believe old houses are much better"* which means if they had the choice, the 67% could rise to 75-80% which is more realistic and reflects RIBA Survey results on 2013. This section clearly answered objective five which is about people interest in the new build homes.

5.5.3 Questions 4, 6, 7 and 8 analyses

Participants were asked about the importance and the impact of space design and layout design on the market and customers interest to buy or rent a new build house. The aim of section is to achieve the last objective which is about investigating the reasons behind people lost their interest in buying new build houses and outline if small space design and lack of architecture are the main factors.

Addressing the importance of these two aspects as a key decision making by customers and identify the negative impact of small spaces and lack or architecture as barriers to sell or rent a new build house. Bar chart below shows the results from analysing grouped questions Q4, Q6, Q7 and Q8, results can be summarised as below:



Questions (4, 6, 7 and 8) are about marketing barriers and the problems associated with the new built houses. According to the bar chart, Q6 shows that 100% of the participant agree on that small spaces and lack of architecture are the main detract and barriers create difficulties for marketing new build houses and made customers lost interest in new built homes.

Results from Q4 and Q8 are supporting previous question, as the bar chart shows 86% of the occupants provide negative feedback regarding the inadequate spaces in the new build houses they already rented or purchased from the estate agent.

62% of the estate agents themselves find inadequate room spaces, small garden and small car park spaces are the main barriers for marketing new build houses. Feedback they receive from the end users after selling or renting new houses shows that 86% of the customers are not happy about the small size of the internal spaces which impacts negatively on the health and wellbeing of the occupants and small garden and lack of car park or small car park spaces are other reasons addressed by estate agents which create disputes between the neighbours. Looking at Q7 the bar chart shows that 91% of the estate agents believe that new build houses needs improvement in term of spaces either internal spaces, garden or car park spaces. 76% thinks that new houses need architectural improvements and more effort to be invested on the design quality.

To conclude analysing responses from estate agents shows the necessity of optimising housing design in term of space design and layout design, otherwise continue building small spaces and replicating traditional design will have a negative impact on the housing industry and on the whole economy in the future.

Analysing the answers for Q10 and Q11, which is purely about estate agents personal choice to see the level of satisfaction and their personal opinion about the houses they chose to live in. Their view is very important to support this study, as despite the fact that they are expertise in selling and letting houses to public, but also they have extremely more chances in selecting the right house for themselves to live in, as they experience many houses on a daily bases, they have access to more information about these houses and they view many houses before the client do, all these reasons gives them a huge opportunity to make the best choice for themselves. As we can see through the answers 62% of them lives in an old house and 38% chose to live in a new build house, however when we look at Q11 which reflects their satisfaction about their new built homes, even who chose to live in a new build home agree that there are many problems associated with the design quality of new built houses especially small internal spaces, small garden and lack of car park are the most highlighted factors, again these answers from expertise evidence the necessity of optimising the design of new build houses and invest more in the design quality, provide adequate spaces to achieve occupants satisfaction.

5.5.4 Section Conclusion

To conclude analysing the survey questioner, all the answers show that neither people nor expertise are satisfied with the design quality of new built houses in term of space design and layout design, and these are the key factors behind that, people lost interest in buying or renting new build houses. Constancy among the answer can be summarised as the small internal spaces, small car park or lack of it, small gardens and lack of architecture are the shared key points among all the answers. However the outlined problems associated with the new built houses have a negative impact on the housing industry, national economy, people's health and wellbeing. Optimising the design of new housing in the UK is necessary and immediate action required avoiding future implications which will take a long time, money and effort to be sorted. Small spaces and layout design should be revised, embedding national minimum space standard and design standard within planning policy and building regulation become a requirement, otherwise developers continue building small poorly designed houses and facing a housing disaster is expected.

Chapter 6 – Conclusions

6.1 Scope of Chapter

This section highlights the outcome of this study, underline the main key issues affecting housing design in the UK, answering research questions and summarising significant findings which been discussed earlier. The chapter will discuss how the aims and objectivise have been achieved and highlight the barriers and limitation of this research, as well as personal reflection and recommendation for further study on this topic.

6.2 Reintroduction

Concluding literature review chapter, house is the most expensive and most life changing product we ever have. House design should develop and respond the changes take place in technology, environment and lifestyle and must be able to accommodate people needs. However, in the UK, replication of traditional and post war house design could be seen clearly everywhere, despite the fact that life style has been changed dramatically in the last 15 years, but looking at the new built house design it is not reflecting this change. According to the research data by RIBA, UK has the smallest house size, most energy inefficient and the most expensive houses in Europe (RIBA 2013). Highest percentage of the UK housing developed and built by private developers and housing association (BBC 2015), so they are responsible for designing our homes and shaping our life, they should engage more with public to include their requirements and share their views while designing new homes. Absence of National Space Standard and National Design Standards resulted in producing small houses having similar form, lacking adequate spaces and architecture characteristic. Previous studies show that small spaces and inadequate space have negative impact on the health of occupants and result in marital disputes and prevent children from achieving maximum potential. Building narrow front small houses result in creating unsustainable environment, overcrowded and increase conflict cases between neighbours. It is not housing developers fault, they are responding to the market, Planning Policy and Building Regulations. Similar to any other business they try to make themselves as profitable as possible. The change must come from the Government and Planning Authorities to provide National Minimum Space Standards and National Design Standard Regulations. Research outcomes highlights most of the factors affecting housing design in the UK, provide professionals view working in the construction industry designing and developing new build houses.

6.3 Methodology reintroduction

In addition to the intensive theoretical information collected within the literature review a mix of qualitative and quantitative approach has been adopted for this research. Qualitative methodology is the main drive however quantitative methodology adopted to understand the behaviour of the data. Qualitative approach includes semi structured interviews to understand developers view on housing design and the barriers preventing them from change. To provide better support and higher credibility for the discussion and analyses, another method has been adopted which is visual analyses through collecting different developer's brochure and access their formal websites to compare the layout design of different houses in different locations and find constancy in design between different developers to be used as evidence of traditional design replication through decades which all leads to provide unhealthy environment and have negative impact on both housing industry and economy.

Quantitative methodology presented in a carefully designed questionnaire to ask estate agents about public's view and expectations of the future house as they are the key link between developers and the end users and their personal view is very important, they are responsible for marketing new build houses and they are the people who obtain the realistic feedback from the end-users.

6.4 Objective's review

Meeting the objectives is one of the key achievements in this study. This section explains how the objectives were achieved and shade light on the barriers limited the achievement of some of the objectives.

Objective 1: To investigate the range of stakeholder views and perspectives on the design and quality of new generations of houses in the UK;

Looking at the literature review, survey and research data shows that only 1 in 4 people prefer to buy or rent a new build house (RIBA, 2013), and 60% of occupants feels dissatisfied with their new built houses after they moved in (IPSOS, MORI and RIBA 2013). Most of the people addressed the issue of small and inadequate space design, small rooms, small garages, small gardens, narrow front design which created overcrowded and unsustainable environment. Other researches accomplished by HHSRS shows that small inadequate design will impact negatively on health and wellbeing (HHSRS 2014).

Quantitative methodology adopted to answer this objective through analysing the data generated from the survey which shows that:

- According to the feedbacks obtained by the estate agents from their customers 67% of the people prefer to live in an old house.
- 62% of the Estate Agents themselves chose to live in an old house,
- 86% of their customers are not satisfied about space design,
- 100% of the Agents agreed that good space design and layout design attract customers to invest in new build design.
- 91% agreed that small space and layout design needs improvement and they are the main barrier for creating marketing difficulties and peoples lost interest in buying or renting new build houses.
- 75% of the new build house customers are from younger generation who represent first time buyer and the key reason is marketing tools and the availability of Governments (help to buy scheme) which is only available for new build houses to help first time buyers get to the house ladder.

Objective 2: To investigate the key reasons that affected housing design in the UK;

Considering information collected from the literature review developers are responding to the market demand, no evidence could be found show any kind of researches, survey or any involvement of peoples view in the design process. Many problems associated with the new built homes in the last 15 years and this is one of the key reasons behind making 1 in 4 people prefer to live in an old house rather than a new house (Home wise camping 2013).

Looking at the qualitative data analysing interview answers outlined that volume developers looking at houses similar to any other product, it is about mass production and achieve the targeted profit. The entire 8 participant agreed that they don't involve peoples view in the design process and the only research they are doing is market research to understand the number of bedrooms required in the area which help them selling their houses in a short time gain the profit and use the money for more developments.

Key shared points among interview participant were:

- Building small houses to increase the unit output on the same site and maximise profit.
- Recycling traditional design to save time and investing on the design process.
- Replication of design towards more standardisation as mass producer bringing down the cost of every element to minimum.
- UK housing shortage and market high demand helped developers to sell or let out any house they build, regardless the quality.
- For volume developers it is purely about quantity not quality.

Visual analyses method shows clearly layout design replication in different location by different developers. Documents in section 5.5.2 proved the recycle of the same layout design by the same developer in two different locations disregard the impact of blocking the window on the layout design.

Quantitative approach represented in a well detailed questioner completed by Estate Agents who representing the active link between the developers and the occupants. Analysing the data shows that:

- All participant agreed on the main barrier for marketing new built houses are small spaces and layout design, feedback obtained from buyers or tenant's evidence that they are not satisfied with new build houses and the government's scheme was behind their decision making which is only for new build houses otherwise they chose to buy or rent an old house.
- 100% of the participants agreed that UK new houses needs improvement in term of small spaces and layout design to avoid marketing difficulties and satisfy customers, new build houses is about achieving quantity not quality and maximising developers profit.
- No evidence shown that estate agents involved in doing any kind of research or survey to share people needs and expectation in the design process.

Objective 3: To identify if meeting minimum Building Regulation and national energy agenda is the drive or target for designing new houses.

Analysing information from the secondary data shows that, there are different advanced housing systems in the UK such as Code for Sustainable Homes, Passivhaus, Eco House and Green House which is adopted by few developers built very little number or very little percentage of the overall houses.

The reasons can be summarised as below:

- Land purchase comes with a condition of building a low number of specific housing type
- Local Planning Authority requirement,
- Otherwise achieving minimum standard is the target.

Interview participant agreed on that achieving minimum standard is the target not the drive and Energy Agenda has no direct impact on the design and one of the evidence is that Code for Sustainable Homes has been scrapped recently because developers couldn't achieve any of the codes apart of code 3 which is minimum requirement (Clark 2015). All 8 participants agreed on that:

- Adding advanced technology or using different building method increase the cost between 8-12% and reduce developer's profitability.
- For a developer a house take 16 weeks to build and with including the new technologies or changing construction method it takes 25 weeks which means slowing down building process, so time will be affected and again reduce developer's profitability.
- It is not adding value to the property,
- The demand for housing is so high; they don't need to build above minimum.

Objective 4: To evaluate the value of good design for house owners' designers and property investors

Analysing information gathered from the literature review answered this objective clearly. Volume developers are like any other business aim to make profit and pay their shareholders, looking at house as any other product trying to bring the cost down to maximise the profit. Due to housing shortage and market high demand, it is more about achieving the target set by the government and planning authorities, so the quantity compromised quality. Property investor doesn't want to invest in the design process, achieving minimum standards and produce more units is the target to maximise their profit first and secondly satisfy the Government and Planning Authorities.

Good design is the last bottom line for property investors due to:

- Housing shortage and market high demand allow investors to sell any house they build,
- Lack of minimum space standard and design standard gave them freedom to build small Houses and recycle old designs without looking at people needs.
- Good design means investing more money and time which reduce developer's profit.

Two case studies in the literature review chapter presented as real life evidence on investing more on design quality.

The case of Oxley Woods Development and London Micro-homes has been identified better use of space through managing the design differently and accommodate modern life needs, as sharing public views in the design process and identify modern lifestyle requirements is a key factor affect any design and will be the drive to achieve better use of spaces and keep within the trend.

Analysing interview answers shows that most of the participant agreed on those developing houses is more about making money and achieve quantity. Most of the companies have a core of designs, architects not involved; the technicians recycle the existing design making a little change and alteration to suit the site. Good design is the last bottom line for property investors, developers invest more in design quality only when it is required by Planning Authority or coming as a conditional offer for purchasing the site.

Visual analyses method outlined clearly the similarity in layout design in different locations by different developers which means developers are not concerned about inventing new designs; it is more about the number of output. Figure 24 shows replication of designs used 100 years ago for completely different style of life and for people with different requirement and needs.

Looking at the data generated from the questioner, 76% of the participant agreed that new build houses require improvement in term of space design and layout design, and developers should invest more on the design quality. However most of the survey participant found that poor design become a barrier for selling and renting new build houses and estate agents facing marketing difficulties which have a negative impact on the industry and national economy in the future.

Objective 5: To highlight the factors resulted in producing the houses we see today;

This objective has been achieved first: theoretically through analysing the information collected during the literature review to highlight the factors affected housing design and pushed developers to build smaller houses and recycle traditional and old form design and can be summarised as follows:

Market has the major influence on the way developers design new build houses, key factors are:

- As discussed in the Literature Review Chapter historically, traditional and post-war housing design style exist since 18th Century and replicated through decades either as a temporary solution or as a respond to a certain emergency or disaster such as, the needs to accommodate working class families after the industrial revolution at mid-18th Century, or increasing migration from villages to cities at mid-19th Century and after the Second World War again this style became popular due to necessity of providing a high number of houses destroyed by the war and to replace the slum developed during the war, and now the replication justified as a response to UK housing shortage which resulted in quantity compromised quality.
- Lack of fixed price for the land in the UK, which means developers recover the high price of land through building smaller houses, increase the unite output and make the expected profit.
- Investing minimum time and cost in the design process through recycling traditional design to increases the level of standardisation and use same suppliers to bring down the cost of every single piece to minimum.

Adopting qualitative methodology and design a semi structured interview face to face with expertise from the design teams working for private and public housing developers framed the realistic factors behind reducing the size of new built houses in the UK.

Considering Interview answers the key shared points among all the participants is market influence is the main drive and the main factor affecting space and layout design of new build houses:

- To maximise the build cost to value ratio and gain the targeted profit. Developers produce more unites on the same site through building smaller houses and replicating similar design.
- Time for planning approval, is another sub factor which is tied back to the non-fixed land price, as planning approval takes between 12 to 15 months instead of 13 weeks which is the standard and by the time developers obtain planning permission, price of the land increases and the only way to recover the increased price is through building similar uncharacteristic smaller houses.

This objective has been achieved through visual analyse method, collecting brochures from UK leading developers, interpret and analyse them individually to show the similarity of layout design among different developers:

- Despite the fact that these houses have been designed by different developers in different location similarity in layout design could be seen clearly.
- Developers recycle same layout design to avoid investing in the design process.
- Layout design similarity is clear between new build houses and post war houses.

6.5. Conclude research questions

1- **Why UK houses are the SMALLEST, UNCHARACTERISTIC most EXPENSIVE, POOR QUALITY and most ENERGY INEFFICIENT houses in Europe?**

Analysing information and data generated from the literature review and expert interviews shows that:

-The government has set a target to tackle housing shortage in the UK, and the target is to build minimum of 248,000 houses a year to cover market demand and population growth. UK will need at least another three and a half million houses by 2031 (Holmans 2013).

-UK government, planning authority and developers aims to achieve the required density, focusing more on quantity not quality

- (EXPENSIVE) Land is very expensive and land price is not fixed in the UK. Housing developers try to drive down the overall cost so they can pay as much as they can for the land, so the choice is: **(SMALLEST)** either increasing the unit output through building smaller houses, or **(POOR QUALITY)** reduce the quality and build cheapest houses. The whole industry is about to try to pay as much as possible for the land, which means there are not much left to spend on building quality.

-(SMALLAEST) Lack of National Minimum Space Standard and Design Standard within Building Regulation and Planning Policy encouraged developers to build small and to minimum standard and specification.

-(ENERGY INEFFICIENT) Energy agenda and environment efficiency not important, because they look for volume not quality and It is adding to the cost not the house value, developers are free to build code 3 or no code and they scraped code 6 sustainable homes because all the practises of brick and block work they know that they can't achieve code 6 or even 5, it can be done if they stop brick and block technology and use a more standard contemporary style then we can drive innovation in the design world.

-(UNCHARACTERISTIC) Housing developers define their specification, by process of using buyers to agree the spec of the walls, the targeted windows they were using and the floors, and they keep doing that over and over to bring every last piece of the building down to the cheapest it can possible before their general specification. They design these houses in a purely technical way that has a very limited architecture in it. The only way to change housing style is to be pushed by planning authority and building regulations, as a business we target the minimum. The demand for housing is so high; they don't need to build above minimum,

2- Why UK developers' are still recycling old house design (designs from the19th Century and post-war housing design) for new housing developments?

-British Housing Sector is more about bricks and mortar, there are far more mortgage lenders for brick and mortar than there are for timber frame houses or any other type of houses, the market is tied to a very safe mind-set.

-In term of style contemporary architecture is extremely costly to get the right design in this country; it is easy in somewhere like Spain because they don't have thermal insulation and condensation problem that we have it in the UK.

External wall bricks and concrete blocks drives UK housing sector and the whole market is built on it. Developers want to build and sell quickly, creating a more standard systematic housing sector, they build only what they can sell to keep market demand for housing and maintain the high price, they don't want their money to sit in standing stock, for the volume develop market is the key.

-Building different houses such as Passivhaus or sustainable house must be pushed by planners, building contemporary houses have the risk of that people aren't ready for it and the nervousness of the marketing team and developers pushing it back.

-The houses we see today is still the standard models from Victorian, money lenders don't care about the layout design or how wide or how narrow is the house, it is more about numbers of the bedrooms.

-Because of the housing shortage it is difficult to jump to these new technologies and these new ways of building houses, now a house takes 16 weeks to build and with these new technologies it takes 25 weeks which means slowing down the building process, and also raise the cost.

-Always UK had housing styles, Victorian houses, Georgian houses, Edwardian houses, early 20 Century houses, however since 1960s there was a void of design style and lost ability to create a new style, may be the new style will happen when there is more futuristic and more contemporary living style in more glass steel houses with renewable advanced technology.

3- What are the main factors affecting the design of new build houses?

The marketing has the main influence, developers do a lot of marketing research for each development individually, and the research marketing is more related to the type of the houses in term of bedroom numbers. The local authority do their own evaluations in their area, and they decide how many one bed, two beds, three beds, bungalow, detached or terraced required, then they provide developers with the percentage list, if developers deviate from the required housing mix by planning authority they will refuse planning.

-Another factor is about driving down cost so they can pay as much as they can for the land. The type of houses or design of a development will start with what the market house can sell the houses for, they don't want to build a single square foot more than is necessary to maximise the build cost to value ratio. So it is more about quantity and marketing not the design or architectural characteristic.

-Another key factor influencing the design is achieving the required coverage that actually makes the value of all the houses you designing or plotting on that site meet or exceeds the land value that they paid. Usually it is quite high so they end up, a lot of the time with the design quality has been compromised by the very fact that they have to squeeze them in and really maximise it.

4- How can UK housing design be optimise to meet current modern lifestyle needs?

-All developers build to a minimum standard and specification unless it is required by the planning authority or Building Regulations. The focus is all on quantity, not quality. Building above the required specification needs adding to the cost and time and it doesn't add to the marketing value. Due to the demand and supply gap in the housing market, developers can sell any house they build, so achieving the minimum standard is the drive. For these reasons housing designs cannot be optimised without having a **National Minimum Space Standard** and **National Design Standard** to stop building small houses with inadequate spaces and **National Housing Design Competition** should lead every single development to encourage developers invest more in the design. Developers will respond to these standards if it is required by planning authority and building regulation and it will result in pushing them to invest more in the design and try another method of construction. Oxley Woods Housing Development in Milton Keynes has been used as a case study in this research to evidence the success of a new model of housing development, not only new design approach for the space and the form design, in addition to that used Modern Method of Construction using different materials and techniques. This development won the Design for Manufacture Competition, which suggest at a minimum that there is some evidence of innovation to break the mould of existing trend.

-Housing developers are responding to the market, planning policy and building regulations. Similar to any other business they try to make themselves as profitable as possible. If the government changed like London planning authority and provide house standards, minimum space standards, cycle storage, bonus points getting above statutory minimum (which is code 5 and 6), if the Government specified these requirement, the house developer will respond. They don't like it but they have to do it and respond to it. Unless someone tell them what to do they will continue and go for the cheapest and achieving minimum regulation requirements will be the target.

-One of the biggest problems is the green belt and many people at the bottom of the ladder they don't want you to release the extra mile outside the green belt, one because of the building on green country side, secondly they don't want their house to reduce value. If instantly supply of houses increased, the value of all properties will come down, so this will create more problems, **optimising housing design** in a way accommodate 21 century requirements and supplying enough houses to keep the price level is a better solution.

-Cheaper land price could allow developers to invest more in design and create larger and better spaces.

-Fixed land price is the solution, nothing beyond that, if developers have a 10 year development you put the increased value of houses in the design but in the UK it goes to land owners.

-Encouraging self-build to build their own houses and invest more in design and layout, but again the land will be a problem. Providing fixed price plots with a regulated frame will help, keeping with the parameter of regulation.

-In terms of internal space optimisation, designing wider homes, more open plan spaces which can be divided using removable walls, with floor to ceiling large windows to provide maximum natural light, underfloor heating system to save space and avoid bulky radiators, more storage spaces, wider stair cases to accommodate stair lift, bathroom on ground and first floor, non-load bearing walls at the back and front of the house for future extension without any major structural work to obtain family expansion.
- External space optimisation could be through bringing the garden from the back of the house to the front, so the front garden includes waste and Recycling Storage area, providing a space for the 3-6 recycling rubbish bin and a space for parking minimum of one car can be included within the design. As a consequence of constant overlooking the garden from the living room and the kitchen windows and also parking a car and having the rubbish bins, result in a daily continuous use of the garden which pushes people to pay more attention and maintain the garden regularly, creating a well maintained and practical space.

This change could reduce the problem of car parking and conflicts on the car park, and also streets become free from the large number of ugly wheelie rubbish bins. Having the garden at the front could provide more security to the house, and contribute to reduce housing crime. Kitchen and living room windows look over the garden and provide free lighting during night, research shows that people feel safer with a well-lit gardens (Poyner 2006). To conclud, changing the design of the garden location could increase preservation, free crime community, practicality and house security.

6.6. Validity of the findings

Information from the literature review addressed and defined most of the problems associated with the new built houses in the last 15 years and the consequences generated from this action, which resulted in producing small and uncharacteristic houses. House providers produced a large number of houses lacking adequate internal spaces and architectural characteristic resulted in a lost community identity. As discussed in previous chapters building smaller houses create overcrowded, unhealthy and unsustainable environment, also have negative impacts on the occupants health and wellbeing. Another negative impact resulting from building smaller houses is conflicts and disputes between neighbours due to noise, lack of spaces for rubbish bin and lack of parking spaces. All these problems resulted in most of the people lost interest to live in a new built house due to poor quality design and inadequate spaces, developers and estate agents facing marketing difficulties to sell or rent out new built houses and that is why majority of housing developers use different marketing tool and governments help to buy scheme to sell their houses despite the fact that UK market suffers housing shortage, as the trend of new built houses is more about profit and quantity not quality, achieving governments target and required density by the planning authorities. After analysing information from the literature review, interview with experts, questioner and questioning estate agents and documentation analyses, the suggested solution is providing National Minimum Space Standard and embedding it within Planning Policy or Building Regulation which lead to invest more in the design and provide functional, adequate spaces and developers have no choice but respond to these requirements otherwise it will be difficult to obtain planning approval.

The other aspect of this research is housing layout in term of shape, appearance, materials and architecture characteristic. Recycling traditional design and replication of post war houses have been identified clearly in the previous chapters. Traditional design doesn't work in high density developments as proven earlier. Lack of architectural characteristic resulted in creating communities with lost identity and a gap of style can be recognised. Analysing literature review, interview answers, questioner and case studies shows that providing National Design Standard is necessary and unavoidable. Lifestyle has changed dramatically in the last 15 years, and housing design should be optimised in a way comply with these changes.

6.7. Limitation of the study

Although this study achieved the planned aim and objectives, but some limitation were unavoidable, first is a statistical and data limitation. This research scheduled for arranging more interviews with the housing association's design teams, as they are responsible for designing and building high percentage of housing in the UK. This could give a wider context of the problems with housing design quality, despite the fact that they rent out most of their properties and they are a non-profit organisation, so they look at the design quality and layout from a different perspective, maybe the design quality they are targeted for, is different from private developers. Face to face semi structured interviews were arranged with members of the Housing Association designing team working for five of the largest UK Housing Associations to understand their theoretical and practical design approach, outlining the key factors influencing their design, and highlight if the quantity of social housing become more important agenda rather than design quality. However, all the interviews were candled due to organisations, policy for releasing information and confidentiality of their data. This is an area which is missing from this study and it could help collecting more evidence on the poor quality investment in housing design and it is important to understand if social and affordable house provider have different requirements and needs for their occupants. Second limitation is impact limitation. Considering information and accessing Local Councils and Planning Authority data could have substantial impact on the outcomes. It is important to understand their view and future plans for providing better housing quality in term of adequate spaces and form design. Third limitation is study design limitation. Collecting data and further research required on health related issues, looking at the negative impact of small spaces on occupant's health. This is an important area should be explored, however time restriction and including social sciences within this research context could make it difficult to control and complete at the time scheduled for this research.

Collecting data from the Estate Agents was the hardest part of this study, which is considered one of the key elements reflecting public view, as they represent the active link between developer and end-users and responsible for marketing these houses. Started by emailing Estate Agents randomly as an active way to collect as much as possible data from different location in the UK, then distribute hard copies to be scanned or posted when complete. The plan was to receive around a minimum of 50 completed questionnaires, however, only two completed responses were received, so the only solution was to travel and take the questionnaires and ask the estate agents to complete after explaining the research objectives, this method was difficult due to lack of time and the many marketing questionnaire they receive every day. Considering incentive method may work better, as research shows that most of the people complete a questionnaire because they are expecting to win a reward or present (Saunders M, Lewis P, and Thornhill A 2007). Addressing limitation of this study could result in providing more proposal ideas for future researches beyond the scope of this study.

6.8. Future Research Work

This study outlined most of the problems associated with newly built houses, however the focus is only on two aspects size and form design. Pushing this research to have a stronger impact on the construction industry and planning policy, other areas must be consider to fulfil the gaps.

-Obtaining feedback from end users and share public view is an important element to frame the problems related to the size and functionality of spaces. A national survey should carry out to understand and ask people about what they are expecting to find in a new build house, include their expectations to develop a new standard based on these findings, then Analyse and compare between the level of satisfaction of old house occupiers and new build houses occupiers to find out if the design can be managed differently.

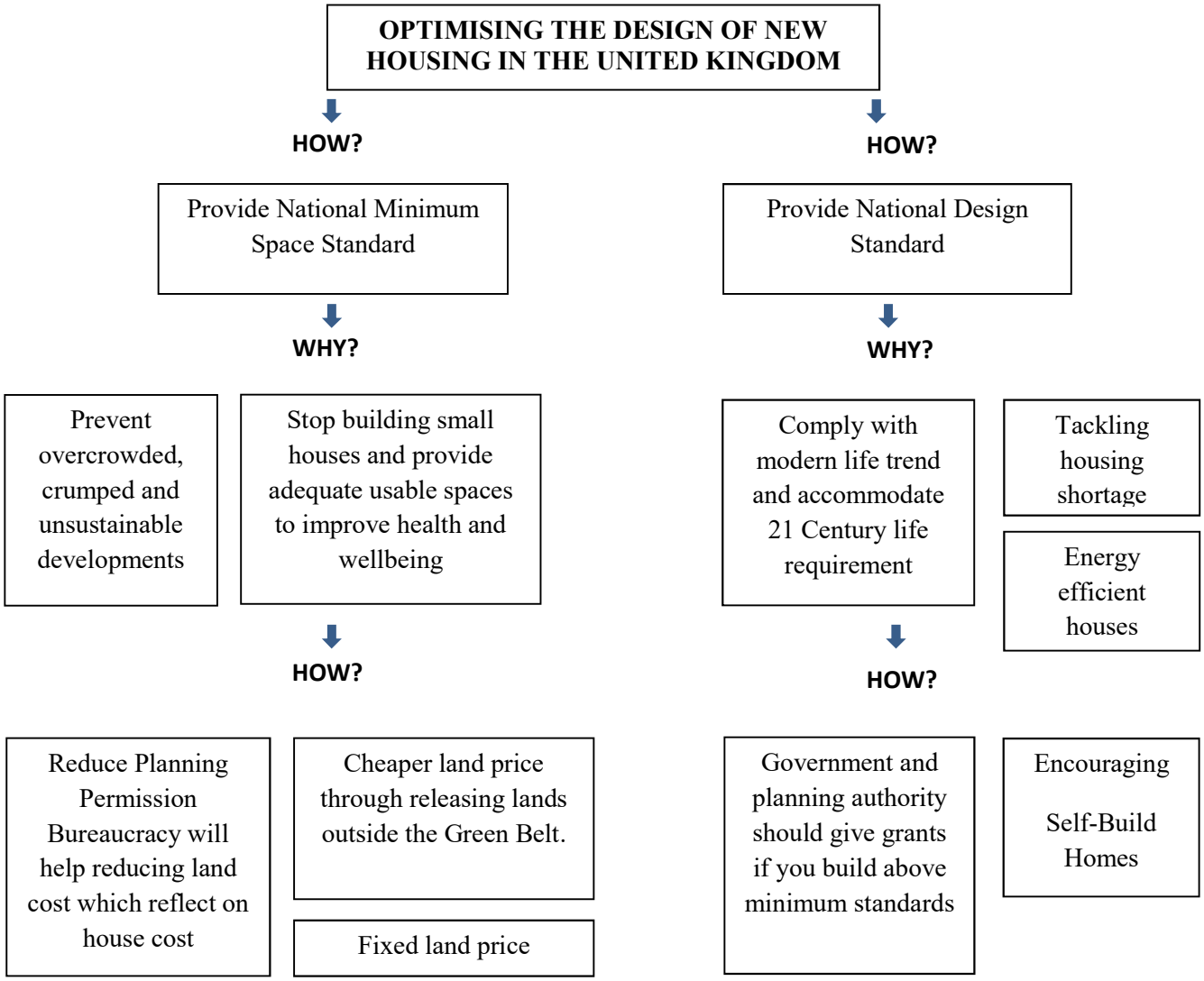
- One future research could be an evaluation of one of the European country's National Space Standard and investigate if the model can be adapted for the UK housing sector and whether it can be implemented within the Local Planning Policy or Building Regulation. Using an established European model can be the start for setting bars to prevent reducing size of the houses and push developers towards a more innovative form design.

- The negative impact of small spaces on occupant's health is a very serious issue and it has been covered in this study shallowly. Many research carried out on the impact of overcrowded spaces on a child's performance or the possible health risk when living in a small apartment. However an in depth research required to monitor the occupants health, living in small houses.

- A depth research on the conflicts and problems between neighbours as a result of reducing the house size and building narrow fronted terraced house. Conflict on car parking, noise and lack of privacy. Accessing Housing Association data and work with the Authority to identify the number of conflict cases arise due to inadequate space design.

Diagram below summarise why optimising housing design in the UK is necessary and unavoidable?

Diagram below summarise suggested and recommended solution …



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7.2. Appendices:

7.2.1 Interview questions and answers transcript:

INTERVIEW 1-2

TOM BARROWS Urban Designer - Associate Director IDP GROUP, worked for Taylor Wimpey and Morris Homes

BEN FLIPPANCE: Design Active, major housing projects, major public sector site, arranging competition architecture for developers, exemplar housing scheme make sure how that is gets delivered, Housing associations, Life time homes, specifications, tender, contracted, quality houses, code 5 or 6, Passive House Refurbishment, design the first passive house design tower in Coventry (not been built),

Q1: If we talk about the house developers they have absolutely do not care about the quality of the new buildings, what they do they define their specification, by process of using buyers to agree the spec of the walls, the targeted windows they were using and the floors, and they keep doing that over and over to bring every last piece of the building down to the cheapest it can possible be for their general specification. They design their buildings themselves they design them in a purely technical way that has a very limited architecture in it.

The size of them is come out of absolutely optimizing the size a unit needs to be for a certain type of family or type of demographic,

So the type of houses or design of a development will start with what the market house can sell the houses for, they don't want to build a single square foot more than is necessary to maximise the build cost to value ratio.

In some areas they can create values if you are in south east some time it will the case of adding balconies or adding room nice big spaces or big gardens, because in those locations you can sell the same house for more money if you have these extras to the houses,

Tom: Generally it is coming from the theory of "garden city Follow your money" the whole idea is about driving down cost so they can pay as much as they can for the land, every piece of land come out to market and the agent will say who wants to buy the site was most you can give me, you must give me the highest price, so either you need to build more number houses, or build the cheapest houses they are the one will win the site, the whole industry is about to try to pay as much as possible for the land, which means there are nothing to spend on building quality,

Tom: one of the key factors influencing the design is achieving the required coverage that actually makes is the value of all the houses you designing or plotting on that site meet or exceeds the land value

that they paid, usually it is quite high so you end up, a lot of the time with the design quality is been compromised by the very fact that you have to squeeze them in and really maximise it, really make them efficient, you given a book of templates just floor plates to design it to be the most economical way of delivering a three or five bedroom house, we have a very limited pallet of freedom may be change some materials but they don't like you to touch anything structural on them, it is purely from a process that they are volume builders, they have to deliver volumes, if they have to start building every single product bespoke they don't have the internal infrastructure to coop with that, just like IKEA for example if you want to build 10000 wardrobes it has a different door size double effect the delivery of them being able to deliver 10000 of the same wardrobes,

BEN: They design for production it is a fare description,

M14/ In term of choice of housing there is one very very big thing related to history, because UK is industrial revelation country, people in England used to the idea that cities grow with a row of terraced houses, built for workers, and still we have large number of back to back very small tiny houses, we have an acceptance in history of small houses for workers,

The whole economy of an entire town started with one business and rows of terraced houses, it become a traditional.

In term of style Contemporary architecture is extremely costly to get the right design in this country, it is easy in somewhere like Spain because they don't have thermal insulation and condensation problem that we have it in the UK, external wall brick and block which drives our house types, it is very good for our climate and market and the whole market is built on it, developers want to build and sell quickly, more become system building style, historically wasn't necessary to be built quickly, they want to build only what they can sell to keep the price up, they don't want their money to sat in standing stock, for the volume develop market this is the key.

M18: Q2:

Tom: there are two side of this: one is the local authority it is their responsibility to specify what the housing need is? They have a lot of information on particular social housing and they have a list of the number and size of the families need housing, usually drives the percentage of affordable and what type of housing should be put in. and secondly we go to ask the estate agents and property expertise, marketing companies. The point of engagement with the public is after feasibility to design our scheme essentially the shape of it, more be asking people for their views, no one really interested particularly in the design of the houses, it is more about the principal of having the houses there.

M19 people been desensitized what good house it could be like, they take what they given because it is all the same for house builders, market driven,

Planning policy is forcing a certain level of density development,

It is more about achieving numbers and coverage, and build to minimum quality and specification they worked out. Very rear the planning authority ask for higher quality may be for a specific area,

Some time we use consultation but within the scope of the developer not the what the people wants,

people want to pay money for maximising the space they get for their money, If you have two houses at the same cost and one good quality and smaller and the other bigger and lower quality, people will chose the bigger house,

Q3: Tom: planning process take up to 13 week period of designing, planning authority massively influences, is fundamental, The required density is influencing the design,

PPG3 came out at 2000, before that most of the houses were detached, then after PPG3 they started to encourage high density housing because of the massive population growth, this was the beginning of building narrow fronted tall houses to accommodate more people in a smaller area,

Ben: Planning policy massively impacted on housing design, it was the start of a three story house, small cheap high crumbed as much as possible, they can sell anything and give mortgage to anyone. Many terraces and few semi or detached, to provide affordable houses, now PPG3 is gone but still the impact is there in term of density, however replaced by MPPF which is a new policy it hasn't set any different. The only thing they did is not given the local authority the power and the quality gone down because Local authority doesn't have the power through planning policy to insist more on design quality, It is more about quantity not quality, so the developer build 100 units smaller houses instead of 80 units and less, the planning authority will encourage that, price will be lower because there will be no enough landscape and nice space, developers still make more money because they have 20 more units, they don't view it after they view as production, we are talking about high volume house developer (Barratt, Tylor Wimpy, Persimmon), then you have smaller developers like (Dived Wilson Homes, Bellway, Cala) less volume and better quality, and they build in different areas, you find that as the volume go up the quality come down,

Cala builds larger houses with a higher spec, however Banna Homes bought them to double up their production, now they look at standardising their product to build more houses and this will bring the quality down because you use standard products,

27Tom: Spitfire Homes, is a good example of the other end of the scale they buy sites for no more than 25 houses they build mansion houses, 4-5 bedroom houses, they use designer kitchens and quality materials, their ethos is they designed well and build in higher quality materials they can sell at higher price, and because of that they can't go big, (AS PRODUCTION GO UP QUALITY GO DOWN).

29 Q4 Ben:

Rental sector for housing association is more space and lower quality, so public rental house quality is not high as sale sector. However (PRS private rented sector apartment scheme) coming in a higher quality, grand spaces in a way it should appeal to people and they never empty, and these houses are more sustainable and green due to longer interest investment , they don't make any more money from it, if you buy 25 houses to rent out for next 50 years and you have solar panel on it they pay for themselves and generating cash within the life time investment so the quality dose rate because it stand the test of time and have Constance appeal and could be rented all the time, also the if building is more sustainable it will be more financially viable for them long term, e.g. more heavily insulated homes means no boiler maintenance which benefit both the occupier and the landlord.

Q5: Yes, when people have more money they are willing to spend more money on buildings, IN EUROPE IS MORE ABOUT THE DESIGN OF THE BUILDING BUT HERE IS MORE ABOUT RECOVERING THE COST OF LAND. It is all about Land, our houses is the result of the competitive land, it is all about the bidding the highest for the land, in the UK because the land price is not fixed the more profit you gain the more you have to pay the land owner. So if the price of the properties goes up you have to pay more for the land owner. Everything is in the favourite of the land owner. So everyone is trying to drive down cost to achieve the land price.

Q6: Either the planners has a requirement that 10% of the houses must be built in a specific way or it might be a public sector site then they let you to develop the site in a condition it has to be to be built to a certain standard. There are very isolated cases and it is very rare that you find a volume developer built above the statuary minimum, and at the moment buildings is guided by Building Regulation and Planning Policy. The demand for housing is so high, they don't need to build above minimum, and if people can get mortgages they can sell them any way so they don't need to do more (ABUSING THE HOUSING SHORTAGE),

M38: Housing in Milton Keynes - code level 4 it has flexible adaptable housing which you can move walls and build extensions and loft conversions without any major construction, all the roofs are south facing to put solar panel on them all, trying to build robustness, because it is a public sector site when they sold the site these were the condition of selling the site. (Conditional site sale by public sector).

Knowing all the conditions in advance (10% use of renewable energy)So the developer bring the price of the site down to achieve the required policy, In the UK if you want housing quality you have to force the market to do it. Some academic research shows that in the English housing industry the environmentally sustainable application has a zero influence on the value. No evidence to show that influence.

Q7~: still developer use a 20 meter back to back distance rule to provide efficient gardens, that generate a 10.5 meter garden, bigger than that considered as waste, only who expected to pay a lot of money for a big house expect a big garden and a big garage, Agent report show the market is well proportioned as the market goes up the rooms get bigger, which impact on the hallway, the garden and the garage get bigger, in the city centre big garden could be a good selling tool and advantage for the house, in countryside it is not a very valuable tool. The size of old houses big garden came from the idea of growing food,

45 Q8: if you have the design narrow you will have the garden narrow plus applying the back to back rule, no one have a requirement on the width of the garden, if you increase the width of the garden then on the same piece of land you will have less houses, with narrow front houses the street looks a car park. Some local authorities has design guides with wider house design, but if not guided they don't care if you have a problem with your neighbour for car parking, they care about if you have a shower licking,

Q9: Economic which is Land Price; housing shortage is coming as second influence, however the developers they don't want to supply enough houses, the more you supply the price will go down, they want to keep the demand gap to sell anything they build.

Q10 – No Now, environment efficiency doesn't count at all because they look for volume not quality, developers build code 3 or no code and they scraped code 6 sustainable homes, and it will go inside of Building Regulation. All the practises of brick and block work they can't achieve code 6 or even 5, may be it can be done if you they stop brick and block houses and use a more standard contemporary style then we can drive innovation in the design world, a new design which is new and not done before and it will become normal after that.

Q11: No, only if it is required by public sector or planning policy, or develops for a private rental sector to invest on a long term bases. It is a statuary minimum to cost less.

Q12: if it is a bespoke housing development there is probably an architect involved. But most of the volume development not using architect for designing their homes. More of them they have design team and mostly they are technicians or Architectural Technologist but not architects,

We are planning to build new houses last for 300 years,

What is missing from my research? It is not housing builders' fault they are responding to the market, planning policy and building regulations. Like any other business they try to make themselves as profitable as possible. If the government changed like London and provide house standards, minimum space standards, cycle storage, bonus points getting above statutory minimum. (which is code), if the Gov asked for that the house developer will respond. They don't like it but they have to do it and respond to it. Unless someone tell them what to do they will continue and go for the cheapest. One of the biggest problems is the green belt and many people at the bottom of the ladder they don't want you to release the extra mile outside the green belt, one because of the building on green country side, secondly they don't want their house to reduce value. If instantly supply of houses increased, the value of all properties will come down, so this will create more problems, supplying enough houses to keep the price level is a better solution. Salary rise will help, it is massive disaster if houses loss value, (read Wilson prize the first 50 pages building 21 century homes), we are worried for how we buy the land not how we build it, in Europe they are worried for home make houses look better, Fixed land price is the solution, nothing beyond that, if you have a 10 year development you put the increased value of houses in the design but here it goes to land owners.

109- To build your own house again the land will be a problem. Providing fixed price plots with a regulated frame will help, keeping with the parameter of regulation (ALMERIA HOLAND).

It is a very good idea to have a space standard Design + Space standard everyone could copy or adapt the design. You have to ask why houses in more demand in the UK than elsewhere? Demand forces that. Change should start from parliament fundamental rules, building a new garden city with compulsory price on the green land to have a land fixed price and everyone will benefit, however that will create a large market and influence the other land markets to bring down the price, but the problem the land owner are extreme powerful people they don't let you go that route,

Q1: When you design a house what are the key factors influencing the design (Architecture influences or marketing influences?).

Answers 1: If we talk about the house developers they have absolutely do not care about the quality of the new buildings, what they do they define their specification, by process of using buyers to agree the spec of the walls, the targeted windows they were using and the floors, and they keep doing that over and over to bring every last piece of the building down to the cheapest it can possible be for their general specification. They design their buildings themselves they design them in a purely technical way that has a very limited architecture in it.

The size of them is come out of absolutely optimizing the size a unit needs to be for a certain type of family or type of demographic, so the type of houses or design of a development will start with what the market house can sell the houses for, they don't want to build a single square foot more than is necessary to maximise the build cost to value ratio. In some areas they can create values if you are in south east some time it will the case of adding balconies or adding room nice big spaces or big gardens, because in those locations you can sell the same house for more money if you have these extras to the houses.

Answer 2: Generally it is coming from the theory of "garden city Follow your money" the whole idea is about driving down cost so they can pay as much as they can for the land, every piece of land come out to market and the agent will say who wants to buy the site was most you can give me, you must give me the highest price, so either you need to build more number houses, or build the cheapest houses they are the one will win the site, the whole industry is about to try to pay as much as possible for the land, which means there are nothing to spend on building quality.

Answer 3: marketing has the main influence, we do a lot of marketing research for each development individually, the research marketing is more related to the size of house and the bedroom numbers people are looking for, the local authority they done their own evaluations in their area, and already they decided how many one bed, two beds, three beds, bungalow, detached or terraced required, then they come to us and say that we need 20% of this type 30% of that type, give us a breakdown and if we deviate from that housing mix they will refuse planning. Building Regulation has a major influence as well, I think British Housing Sector it is more about bricks and mortar, there are far more mortgage lenders for brick and mortar than there are for timber frame houses, we are tied to a very safe mind-set, as Barratt and David Wilson we are looking at all new method of construction, for example the new Lego method we are still looking at it and we are going to Japan to see some of these modular houses, Just looking not building it.

Answer 4: it is coming out of the cost; the square footage of a house has an effect on the price, some time you can charge £200 per square foot and sometime you charge a lot more per a square foot, you have to tailed to the market, you might have a 600 foot tow bedroom house which has a certain value,

we have a range of house types, we design small 2beds and large 2 beds, you need to comply with the mix required by planning authority. Despite the fact that timber frame house is more adaptable for changes easier than knocking down block or brick walls, even with timber is more easily to create larger span openings which is difficult with traditional cavity brick block construction you can't create big openings, from the house builders point all is coming down to the cost.

Answer 5: Life time Homes, the house been design to live the life, and if the peoples situation changes, the house could easily adaptable, land is very expensive, materials is very expensive, when the government ask for a life time homes same 2bed house on 600 foot become 800 foot 2bed due to big expense on bigger circulation areas, wider corridors, lift access, adaptation of one of the down stairs room to a bedroom, has influence on the size of the house, regards the actual design of them we very much been a national house builder , very proud of the traditional way and the brand we have, we dictated the wrong word but our head office design all the house types, spending a long time tweaking them and changing them and making a little alteration on them over years, it is a core range of designs come to us and we build them we don't have that much influence a part of a little change in the size of the kitchen make it smaller and the living room larger or vice versa, for example open plan are quite a modern approach and developer are very traditional but worried to apply modern ideas,

Answer 6: Building Regulation has a major influence as well, I think British Housing Sector it is more about bricks and mortar, there are far more mortgage lenders for brick and mortar than there are for timber frame houses.

Despite the fact that timber frame house is more adaptable for changes easier than knocking down block or brick walls, even with timber is more easily to create larger span openings which is difficult with traditional cavity brick block construction you can't create big openings, from the house builders point all is coming down to the cost.

Answer 7: One of the key factors influencing the design is achieving the required coverage that actually makes is the value of all the houses you designing or plotting on that site meet or exceeds the land value that they paid, usually it is quite high so you end up, a lot of the time with the design quality is been compromised by the very fact that you have to squeeze them in and really maximise it, really make them efficient, you given a book of templates just floor plates to design it to be the most economical way of delivering a three or five bedroom house, we have a very limited pallet of freedom may be change some materials but they don't like you to touch anything structural on them, it is purely from a process that they are volume builders, they have to deliver volumes, if they have to start building every single product bespoke they don't have the internal infrastructure to coop with that, just like IKEA for example if you want to build 10000 wardrobes it has a different door size double effect the delivery of

them being able to deliver 10000 of the same wardrobes, they design for production it is a fare description.

Answer 8: In term of choice of housing style there is one very big thing related to history, because UK is industrial revelation country, people in England used to the idea that cities grow with a row of terraced houses, built for workers, and still we have large number of back to back very small tiny houses, we have an acceptance in history of small houses for workers,

The whole economy of an entire town started with one business and rows of terraced houses, it become a traditional.

In term of style Contemporary architecture is extremely costly to get the right design in this country, it is easy in somewhere like Spain because they don't have thermal insulation and condensation problem that we have it in the UK, external wall brick and block which drives our house types, it is very good for our climate and market and the whole market is built on it, developers want to build and sell quickly, more become system building style, historically wasn't necessary to be built quickly, they want to build only what they can sell to keep the price up, they don't want their money to sat in standing stock, for the volume develop market this is the key.

Q2: What kind of market research do you do to understand people's requirement or at least share their views in the design process?

Answer 1: there are two side of this: one is the local authority; it is their responsibility to specify what the housing need is. They have a lot of information on particular social housing and they have a list of the number and size of the families need housing, usually drives the percentage of affordable and what type of housing should be put in. and secondly we go to ask the estate agents and property expertise, marketing companies. The point of engagement with the public is after feasibility to design our scheme essentially the shape of it, asking people for their views? no one really interested particularly in the design of the houses, it is more about the principal of having the houses there.

Answer 2: People been desensitized what good house it could be like, they take what they given because it is all the same for house builders, market driven. Planning policy is forcing a certain level of density development; it is more about achieving numbers and coverage, and build to minimum quality and specification they worked out. Very rear the planning authority asks for higher quality may be for a specific area. Some time we use consultation but within the scope of the developer not what the people wants, people want to pay money for maximising the space they get for their money, If you have two houses at the same cost and one good quality and smaller and the other bigger and lower quality, people will chose the bigger house.

Answer 3: Few years ago we were more traditional in design kitchen, living room and dining layout, we want to know exactly how occupants use these rooms and is it been using it effectively? And find a better way of doing it, we setup a project with Nottingham University, we built a more modern house in Sheffield called project life, we set a competition for a family to live in the house for 6 months, and we monitored them, then we knew exactly how they use the house and who is using which part of the house, then we discovered that the dining room where used very rarely, everyone eat in the kitchen, we also found that the kitchen is the Hub of the house, so we backed-up that theory and from that we changed the design of our houses to a more open plan family kitchen living use a lot more glass, bringing more light in, and bringing the glazed doors to the back of the kitchen so your doors open and to have your kitchen, dining and outside as well.

Answer 4: This style of open plan kitchen dinning outside came from the 5 bed houses when you are expecting a large family and we replicated that in a 2 bed houses, if you look at the last 10 years houses you can see the change from a standard traditional layout to have these more combined multiuse spaces, the research we did with Nottingham University seven years ago had a huge impact on our design and actually we had a huge reward out of doing that, we made many mistakes, such as building vertically high rise flats after the world war following modernism trend to house more families and it turned to be a huge social economic disaster,

Answer 5: Client preferences and budget, character and history of the area, sustainability and life length of building, suitability for end user (if end user if not client)

Answer 6: The key factors would be client briefing requirements and urban design issues (i.e. location, context, highways, etc.) Our clients are mostly Registered Social Landlord (RSL) organisations building affordable houses. They rely on Government funding to assist projects to be financially viable, and the products constructed are generally not ‘open market’ sale houses; rather, they are units for rent and for ‘shared ownership’ sale to eligible persons who otherwise cannot afford houses on the open market. Hence, the marketing factor is not a very strong factor in the building design of these houses. There is generally a large shortfall of affordable houses. The above is probably not the case with ‘open market’ sale houses as these require ‘kerb appeal’ for marketability. From our practice perspective, we always endeavour to design houses with a high architectural quality in mind, regardless of whether they are affordable or not.

Answer 7: Mostly we depend on the planning authority’s requirements and we don’t do any kind of research about people needs, it is more about market needs.

Answer 8: Achieving planning authority brief is the target. The councils have their own data about the required type of the houses in the region and we do ask agencies about specific market demand.

Q3: How much influence does the planning process have on designing your properties?

Answer 1: planning process take up to 13 week period of designing, planning authority massively influences, is fundamental, The required density is influencing the design, PPG3 came out at 2000, before that most of the houses were detached, then after PPG3 they started to encourage high density housing because of the massive population growth, this was the beginning of building narrow fronted tall houses to accommodate more people in a smaller area.

Answer 2: Planning policy massively impacted on housing design, it was the start of a three story house, small cheap high crumbed as much as possible, they can sell anything and give mortgage to anyone. Many terraces and few semi or detached, to provide affordable houses, now PPG3 is gone but still the impact is there in term of density, however replaced by MPPF which is a new policy it hasn't set any different. The only thing they did is not given the local authority the power and the quality gone down because Local authority doesn't have the power through planning policy to insist more on design quality, It is more about quantity not quality, so the developer build 100 units smaller houses instead of 80 units and less, the planning authority will encourage that, price will be lower because there will be no enough landscape and nice space, developers still make more money because they have 20 more units, they don't view it after they view as production, we are talking about high volume house developer (Barratt, Tylor Wimpy, Persimmon), then you have smaller developers like (Dived Wilson Homes, Bellway, Cala Homes) less volume and better quality, and they build in different areas, you find that as the volume go up the quality come down, Cala Homes builds larger houses with a higher spec, however Banna Homes bought them to double up their production, now they look at standardising their product to build more houses and this will bring the quality down because you use standard products. Spitfire Homes, is a good example of the other end of the scale they buy sites for no more than 25 houses they build mansion houses, 4-5 bedroom houses, they use designer kitchens and quality materials, their ethos is they designed well and build in higher quality materials they can sell at higher price, and because of that they can't go big, (AS PRODUCTION GO UP QUALITY GO DOWN).

Answer 3: planning authority influence vary from area to area, we were lucky to have our architecture team in Leicestershire, so they designed midland style area, planning authorities has influences on the development layout more than houses layout, the most kind of forward thinking councils want more of the design, connectivity, and out looking development. So they are less concern about individual house types and individual rooms in a house, they want to create a place, councils are more about the percentage of 2beds, 3beds bungalows, and they don't care about the size of spaces or layout,

Answer 4: unless you are building in a conservative are for example Georgian style area or there are stone houses then they ask you to build the same style. It is more visual not internal layout of the houses.

As they say we are experienced house builders and that is our duty, some councils askes for the furniture to be added to the plans to check if a standard double bed will fit properly, we don't use undersized furniture in our show homes, and our senior director go to check the showrooms and make sure every furniture is the standard right size. We spend a lot of time to make sure that the spaces are functional.

Answer 5: How much influence does the planning process have on designing your properties? This depends on the area. If we are in a conservation area or upmarket area it is greatly influenced. Otherwise it is a factor, but the client has more guidance. I believe a design and access statement should be submitted for all type of planning applications, (not just listed buildings and conservation areas) so architects/designers can justify their designs.

Answer 6: Guidelines on planning, urban design issues and highways constrain the layouts and aesthetics of our designs, i.e. separating distances between dwellings to avoid or minimise overlooking, maintenance of building lines with adjacent land, expectations to develop massing and aesthetics that respond to and take cognisance of the surrounding context, requirements for highways accessibility, etc. Other planning considerations include local policies. In some instances, local adopted policies require the development to utilise non renewable energy sources which may include photovoltaic on roofs, necessitating taking this into consideration in the aesthetics. For social affordable housing, the planning process does not appear to have much impact on the visual aesthetic appearance of these developments.

Answer 7: the only time planners will be involved is when they ask for affordable or life time homes type, certain criteria apply by Housing Communities Agency (HCA), it is more about specifying these criteria, for example a kitchen might have a certain cubic capacity of storage, area of the kitchen should accommodate that capacity.

Answer 8: How much influence does the planning process have on designing your properties? This depends on the area. If we are in a conservation area or upmarket area it is greatly influenced. Otherwise it is a factor, but the client has more guidance.

Q4: How important is the design when designing for the rental sector or sale sector?

Answer 1: Rental sector for housing association is more space and lower quality, so public rental house quality is not high as sale sector.

Answer 2: (PRS private rented sector apartment scheme) coming in a higher quality, grand spaces in a way it should appeal to people and they never empty, and these houses are more sustainable and green due to longer interest investment , they don't make any more money from it, if you buy 25 houses to rent out for next 50 years and you have solar panel on it they pay for themselves and generating cash within the life time investment so the quality dose rate because it stand the test of time and have Constance appeal and could be rented all the time, also the if building is more sustainable it will be more financially viable for them long term, e.g. more heavily insulated homes means no boiler maintenance which benefit both the occupier and the landlord.

Answer 3: while we are designing, we don't distinguish between rental and sale sector, we treat them the same,

Answer 4: not now but in the future in 10 years' time we need to consider that as the price of houses getting higher it is difficult for people to buy, there are more people renting rather than buying, a lot of 20 to 40 years old still living in a home with their parents, as an industry we need to consider renting sector, it will be difficult to build and sell

Answer 5: From my experience, it tends not to make a difference. The only difference I've found is if it is purposely designed for a disabled person, then different regulations are enforced.

Answer 6: The following additional remark can be made: Government funding often necessitates adherence to the minimum space standard requirements of the Homes & Communities Agency (HCA), the Government body responsible for administering Government funding. This would be a condition of the funding. These space standards (Design & Quality Standards) tend to be a lot more than the standards adhered to by the speculative, open market sale, developers. Cost is of the essence to this (speculative) sector and they appear to work to the barest minimum standards.

Answer 7: Nevertheless, though, recently national space standards have been advocated which will apply to all houses in the country irrespective of affordable or open market; hence, this difference in spatial standards between speculatively built, open market, houses and affordable houses may disappear.

Answer 8: The social, affordable, sector, on the other hand, in addition to conforming to the Design & Quality Standards of the HCA, has tended, probably until now (as the Coalition Government attempted to steer the affordable sector into new ways of achieving financial viability for projects) to adhere to

standards such as ‘Lifetime Homes’ which impose such requirements as ensuring there is a minimum path of 750mm around beds, making the room much bigger. With the new approach, however, more and more RSL clients are requiring non adherence to Lifetime Homes.

Q5: In a more competitive market do you think that the design of houses becomes a more important factor in marketing?

Answer 1: Yes, when people have more money they are willing to spend more money on buildings, IN EUROPE IS MORE ABOUT THE DESIGN OF THE BUILDING BUT HERE IS MORE ABOUT RECOVERING THE COST OF LAND. It is all about Land, our houses is the result of the competitive land, it is all about the bidding the highest for the land.

Answer 2: in the UK because the land price is not fixed the more profit you gain the more you has to pay the land owner. So if the price of the properties goes up you have to pay more for the land owner. Everything is in the favourite of the land owner. So everyone is trying to drive down cost to achieve the land price.

Answer 3: we want to build more; all developers want to build more, but the planning authorities holding us back, they make it more difficult to get planning, releasing land, the rule of planning on a major application should take no more than 13 weeks from registration to approval and it is very rare, and normally from a site been discovered to a point of working on site across all BARRATT projects it will take 14 months.

Answer 4: Discussion and approval with planning authorities take nearly a year, especially this year the election is coming and releasing land for developer is not a popular thing, most of the planning authority either deferral application or refused it, it is political agenda, the planning authorities not achieving their target and sometime they pretend they are doing well by counting the houses not been built yet,

Answer 5: This also depends on area. I believe for example, a central London resident would be more design conscious than a Bicester resident. Generally when it comes to modern housing, I think the spaces inside are the greater factor e.g. generally an ugly 3bedroom detached house with 2 reception rooms would gain more interest than a beautiful 2 bedroom terraced house with one reception room at the same price.

Answer 6: Definitely yes for open market sales, probably not quite so significant for the affordable rental sector.

Answer 7: Land price is the main factor, trying to bring down all the costs to recover land price, and the long delay to get planning approval is another reason to be considered.

Answer 8: Two reasons, land is very expensive and land price is not fixed, by the time you apply for planning approval land price will go up and you have to pay more for the landowner, sometime we do apply for planning approval for a number of sites at the same time, it will take a year or more to get approval, so for the sites we couldn't get approval all the cost and expenses will be recovered through the new project which been approved, which means customers pay fees spent for the rejected sites.

Q6: Sometimes you only include a limited of modern style houses within a traditional style development, is this used as a market experiment?

Answer 1: Either the planners has a requirement that 10% of the houses must be built in a specific way or it might be a public sector site then they let you to develop the site in a condition it has to be to be built to a certain standard. There are very isolated cases and it is very rare that you find a volume developer built above the statuary minimum, and at the moment buildings is guided by Building Regulation and Planning Policy. The demand for housing is so high, they don't need to build above minimum, and if people can get mortgages they can sell them any way so they don't need to do more (ABUSING THE HOUSING SHORTAGE),

Answer 2: Housing in Milton Keynes - code level 4 it has flexible adaptable housing which you can move walls and build extensions and loft conversions without any major construction, all the roofs are south facing to put solar panel on them all, trying to build robustness, because it is a public sector site when they sold the site these were the condition of selling the site.

(Conditional site sale by public sector). Knowing all the conditions in advance (10% use of renewable energy)So the developer bring the price of the site down to achieve the required policy, In the UK if you want housing quality you have to force the market to do it. Some academic research shows that in the English housing industry the environmentally sustainable application has a zero influence on the value. No evidence to show that influence.

Answer 3: If we build different houses such as Passivhaus or sustainable house it is because of a planning request, we have ideas to build more contemporary houses but the risk is that people aren't ready for it. We like to do it but the nervousness of the marketing team and us pushing it back, we build some 5 to 6 bedroom houses for peoples on high wages and older ages above 50s, we are always talking about it trying to do it, but still we are not sure, even we have some houses with traditional front but round the back more modern fully glazed, putting contemporary edge on the back of the property, it is more about mind set.

Sub question: why you didn't build your own house? It takes a year to get planning approval, and price of the land, and mortgage difficulties. Land is very expensive by the time you secure the planning

approval the price will raise more, difficulties to get mortgage for self-build, and I'm in the business but still scare and nervous about it. Grand Design program shows that always the house you build cost twice as much as you planned, make people more scared when they think these people they know what they are doing but still cost them twice as much as what should cost,

Answer 4: The big question is why developers, builders and planning authorities encourage fake Tudor Victorian style and say that something built 300 - 400 years ago still is the right way to do it? Why we are not doing it at a more modern approach? Always we had styles we had Victorian houses, Georgian houses, Edwardian houses, early 20 Century houses, however since 1960s there was a void of design style and lost ability to create a new style, may be our new style will happen when there is more futuristic and more contemporary everyone is living in more glass steel houses with renewable advanced technology.

Answer 5: I think on these occasions, the authorities have approved small scale modern style houses as they believe it will make a low impact on the traditional area as a whole. I have lived in a development like this of just 6 houses and it was hidden up a lane out of sight from the passing public. (Google maps search 'Mayfield Mews, Oldfield Park, Bath')

Answer 6: Not applicable. This approach is unknown in our practice, as this implies mixing traditional with contemporary and we generally don't do this on the estates we design. However, there are instances where planning requirements on an open market development may require a proportion of units to be affordable. In such instances, two approaches are known: (1) The open market developer would identify a portion of land for affordable houses in order to meet this requirement or, (2) The development would be 'pepper potted' with affordable units among the open market sale houses to avoid distinction between the two.

Answer 7: The users still can't understand these new technologies and the effective way of using it. We build a development with air source heat pumps, at the end the occupiers didn't use it efficiently so we had to put back electric boiler to keep everyone happy. The only way to change housing style is to be pushed by planning authority and building regulations, as a business we target the minimum.

Answer 8: Because of the housing shortage it is difficult to jump to these new technologies and these new ways of building houses, now a house takes 16 weeks to build and with these new technologies it takes 25 weeks which means slowing down the building process, and also raise the cost, solar panel is still expensive and may be in the next 10 years prices coming down and it will be more effective.

Q7: Do you think a small garden is an advantage in selling houses?

Answer 1: still developer use a 20 meter back to back distance rule to provide efficient gardens, that generate a 10.5 meter garden, bigger than that considered as waste, only who expected to pay a lot of money for a big house expect a big garden and a big garage, Agent report show the market is well proportioned as the market goes up the rooms get bigger, which impact on the hallway, the garden and the garage get bigger, in the city centre big garden could be a good selling tool and advantage for the house, in countryside it is not a very valuable tool.

Answer 2: The size of old houses big garden came from the idea of growing food. People who buy new build properties they know what they will have is a 10m length back garden, their mind set tell them it is enough for barbeque enough for small planting.

Answer 3: People realise that if the buy a new build house they will get a small garden, because land is expensive, and going back to minimum set by building regulation 21meter back to back regulation, for every extra meter you give for the garden you loss a house somewhere down the run. Yes we are in a business of building homes for people but also we are in a business to make money for our shareholder to consider. We can't give extra meters for the garden as we wouldn't win the site and another developer will do.

Sub question: but 21 meter back to back regulation doesn't exist anymore, so why still you are using it? Because the planning authority still does, Warwickshire council stick to it rigidly, it is related more to price of land and local planning requirements,

Answer 5: Do you think a small garden is an advantage in selling houses? No, but some people accept it as they feel they have no choice if they have a new build.

Answer 6: No. It really depends on an individual. With starter homes lived in by perhaps a single person household, a small garden might be preferred because there is less work in maintaining it. This may not be true for large families.

Answer 7: No, people looks for larger internal spaces, a small patio for barbecue and small planting area is what they need; large garden needs money and time to maintain.

Answer 8: small or larger gardens doesn't add values to the property, small gardens are more manageable and cheaper to maintain.

Q8: Do you think designing narrow houses gives you a better use, more efficient and more economical of roads and drainage or is it about achieving the required density?

Answer 1: If you have the design narrow you will have the garden narrow plus applying the back to back rule, no one have a requirement on the width of the garden, if you increase the width of the garden

then on the same piece of land you will have less houses, with narrow front houses the street looks a car park.

Answer 2: Some local authorities have design guides with wider house design, but if not guided they don't care if you have a problem with your neighbour for car parking; they care about if you have a shower licking,

Answer 3: Yes still that is a standard models from Victorian, money lenders don't care about how wide or how narrow is the house, it is more about numbers of the bedrooms,

Sub question: If you have narrow front where you will place your 3-5 wheelie bins and cars?

In London we have development with 40% parking and you have to pay, 1.2 Million Pound per flat and £40 000 per parking space. Keeping the garden at the back is more about privacy, security, and traditional mind set.

Answer 5: It is about achieving the required density and achieving maximum profit.

Answer 6: Yes, depending on site configuration. It tends to be the case that our clients require our designs to optimise the site to achieve efficiency in numbers relative to land costs and project financial viability. Narrow houses can do this quite well if the site shape and wider context allow.

Answer 7: It is about achieving quantity not quality, with narrow front houses you can fit more houses on site and make more profit.

Answer 8: with designing narrow front houses saving in construction time, materials quantity and planning authority density requirement can be achieved.

Q9: Which of these factors drive the design of houses in the UK?

- the market
- housing shortage
- materials cost, availability and standardisation
- planning authorities requirement
- practicality

- energy efficiency
- economic
- other factors (give examples)

Answer 1: Economic which is Land Price; housing shortage is coming as second influence, however the developers they don't want to supply enough houses, the more you supply the price will go down, they want to keep the demand gap to sell anything they build.

Answer 2: Economic which is Land Price; housing shortage is coming as second influence, however the developers they don't want to supply enough houses, the more you supply the price will go down, they want to keep the demand gap to sell anything they build.

Answer 3: Q9: housing shortage is coming first, the market, planning authority; materials cost (shortage of brick and timber) Brick supply changed from 2 weeks to 30 weeks, difficulties to find a brick layer, shortage of skilled full labour, in 2008 the market collapsed and all the skilled labours went to other industries and now the market recovered and difficult to find skilled labours,

Answer 4: Jim: for us we have a capacity of 800 houses with the number of houses we have more than that it will be difficult to control.

Answer 5: Which of these factors drive the design of houses in the UK:

-the market

-housing shortage

-materials cost, availability and standardisation

-planning authorities requirement

-practicality

-energy efficiency

-economic

-other factors **Government housing targets**

Answer 6: Which of these factors drive the design of houses in the UK:

- the market
- housing shortage
- materials cost, availability and standardisation
- planning authorities requirement
- practicality

- energy efficiency
- economic
- other factors (give examples)

Materials cost, availability and standardisation is a significant factor. The other factors listed also all play a part as design is a dynamic process.

Answer 7: Housing shortage, secondly land price and material cost.

Answer 8: Housing shortage, economics, others such as housing density.

Q10: Do you see increasing importance of the energy agenda impacting on design quality?

Answer 1: No, environment efficiency doesn't count at all, because they look for volume not quality, developers build code 3 or no code and they scraped code 6 sustainable homes, and it will go inside of Building Regulation.

Answer 2: All the practises of brick and block work they can't achieve code 6 or even 5, may be it can be done if you they stop brick and block houses and use a more standard contemporary style then we can drive innovation in the design world, a new design which is new and not done before and it will become normal after that.

Answer 3: It is add to the cost, you should be careful what to provide, we should been in the stage of carbon emission couple years ago but never we achieved it, I can see we will continue the way we do for a long time, with 2013 Building Regulation we are meeting the standard and we will continue and the next step is putting solar panels on the roof one after one where we get to a point we realise it is not right,

Answer 4: We can't achieve the energy agenda because we can't expand more from 280mm wall now it is 300mm, that affect the design of the houses as the land is very expensive, on a long row of houses you will loss 2 to 3 meters, time for change is not coming yet depend on the part L and the new set of building regulation upgrade and the new governments requirement.

Answer 5: Yes, but I believe there is little knowledge about what we can do and it will take time and education before it makes an impact on all new housing.

Answer 6: I don't. I cannot see the energy agenda impacting aesthetics, internal room layouts, site layouts, etc. But I do see it impacting technical issues, i.e. thicker walls, improved thermal comfort, etc.

Answer 7: Not direct impact sometime used as a marketing tool.

Answer 8: As it is not adding any value to the houses we have to be careful where and when to use these technologies.

Q11: Meeting minimum Building Regulation is the drive or target? Do you think there is any incentive to build above the Building Regulation specification?

Answer 1: No, only if it is required by public sector or planning policy, or develops for a private rental sector to invest on a long term bases. It is a statuary minimum to cost less.

Answer 2: No, unless it is not required by planning authorities achieving minimum is the target.

Answer 3: It is achieving statuary minimum to cost less.

Answer 4: Building Regulation set the minimum target and we comply with minimum standard. We make sure to build to the current regulation when there is a change or upgrade to the regulation. you can't get the full value when you integrate technology, the cost of solar panels you never get the value back at the end of purchase, some like it and some not and ask us to remove it,

Answer 5: This depends on the practice attitude and the client. If the client is the end user, there is more chance that they will want to achieve a better result, if they are doing it to make money; they usually wish to achieve the minimum requirements.

Answer 6: Generally, there is no incentive to build above the minimum building regulation standards. However, improved thermal performance in new houses is a sales factor, i.e. end user enjoys energy savings.

Answer 7: Sticking to minimum standards is the drive and the target.

Answer 8: Unless it is not required by planning authority achieving minimum standards is the target.

Q12: Who is designing your houses: Architects, architectural technologist or planners?

Answer 1: If it is a bespoke housing development there is probably an architect involved. But most of the volume development not using architect for designing their homes.

Answer 2: More of them they have design team and mostly they are technicians or Architectural Technologist but not architects, we are planning to build new houses last for 300 years.

Answer 3: All our houses designed by In house group architect, the architecture technologist also involved in the process. It is more about the mind set and both developer and people are scared from

change, waiting for who do the first jump, we must adapt contemporary living, the last two generation were too similar, but with the next generation there will be a natural move,

Answer 4: We have the core group design; they set a core house design type and the head of that group is an architect, the architect is the base of our design, but we have a core design range which we are allowed to modify, change and adapt to fit to the local setting that required, we all involved with the design of houses, I have changed and adapted most of houses to fit the area changing walls changing positions, the core range designed by architect and all the technicians all involved to adapt coordinate and sometime using outside consultancy as well, planners as well, we have our technical and design department.

Answer 5: This depends on the scale of the job. Generally from my experience the small scale jobs (one off houses, extensions, small developments (less than 10 houses) is designed by the architects, designers and technicians. The large scale developments (regeneration, large developments) are designed by contractor/developers.

Answer 6: Architects and architectural technologists.

Answer 7: we have a design bank which could be altered and change it to fit the new development and requirements.

Answer 8: Mainly designed by architects and architectural technologist and technicians modify the existing design and adapting it to fit the new site.

7.2.2 Sample of the survey questionnaire

1. What percentage of people asking to purchase or rent a new build house?

- Aged below 50 years old %
- Aged above 50 years old %

2. Do you sell most of the new build houses to?

- First time buyers %
- Non first time buyers %
- Investment property buyers %

3. Do you sell most of the new build houses to First Time Buyers because of?

- Government first time buyer scheme is only for new build homes …
- Developers marketing tool such as choice of flooring, kitchen style, car …
- Personal interest of buying a new house just because it is new …

4. Any difficulties or specific barriers to sell or rent out a new build house?

	Very Important	Less important	NOT important
Cost (affordability)			
Lack of architecture			
Lack of car park			
Small room size			
Quality of materials			
Small size gardens			
Others (please specify)			

5. Do you think most of the customers prefer to live in a new build houses or an old house if the COST is not the barrier?

- Customers prefer to live in a new build houses %
- Customers prefer to live in an old house %

6. Any specific features ATTRACT or DETRACT the customer to buy or rent a new build house?

	ATTRACT	DETRACT
A cellar or Basement		
Flat roof		
Internal Spaces layout		
Private car park		
Advanced Technology		
House appearance		
Warranty		
Small rooms		
Small garden		
Quality of materials		
Narrow house front		
Lack of architectural characteristic or identity		
Others (please specify)		

7. How British houses can be improved?

	Very Important	Less important	NOT important
o Architecturally			
o Materials quality			
o Energy efficiency			
o Larger rooms			
o Larger garden			
o Cost			
o Larger spaces for car - parking and wheelie bins			
o Others (please specify)			

8. Do you get any feedback from your customers on?

- o Design
- o Maintenance
- o Material quality
- o Spaces
- o Energy
- o Others (please specify)
- o Are you aware of any comments which are related to the **culture origin** of the buyer?

Now it is all about you!

9. Do you live in an old house or a new build house?

- o Old house
- o New build house

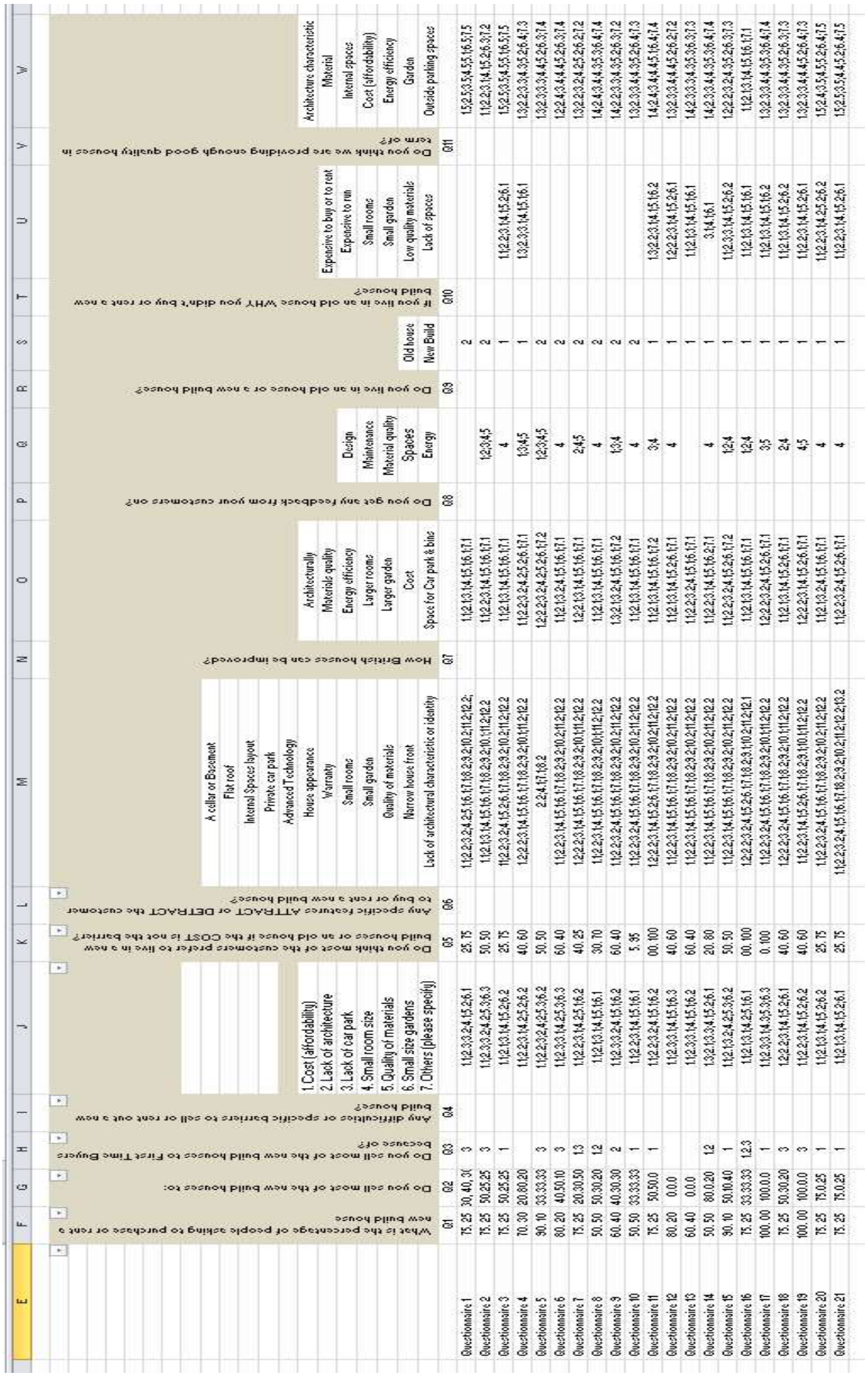
10. If you live in an old house WHY you didn't buy or rent a new build house?

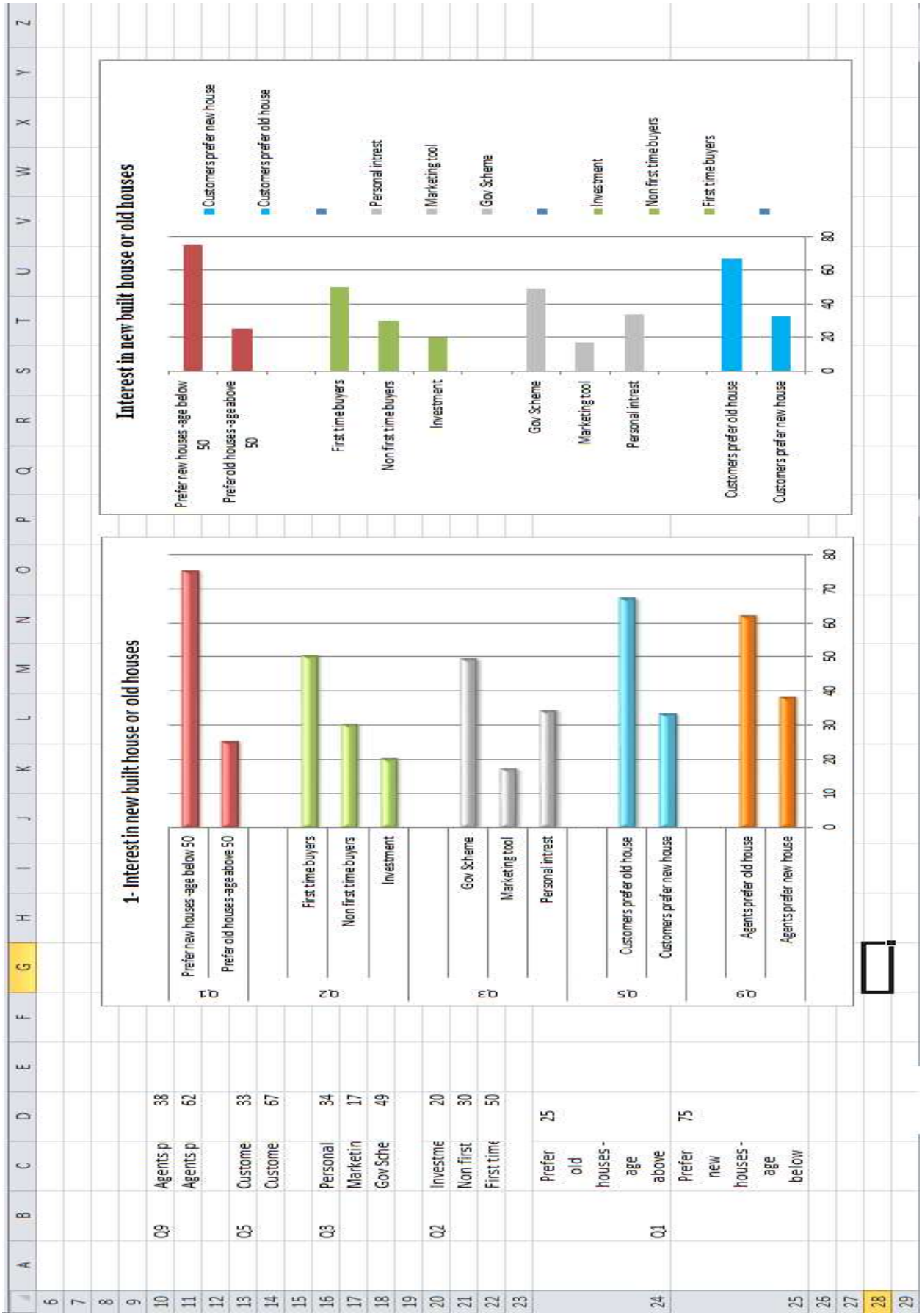
	Very Important	Less important	NOT important
o Expensive to buy or to rent			
o Expensive to run			
o Small rooms			
o Small garden			
o Low quality materials			
o Lack of spaces for car parking and wheelie bins			
o Others (please specify)			

11. Do you think we are providing enough good quality houses in term of?

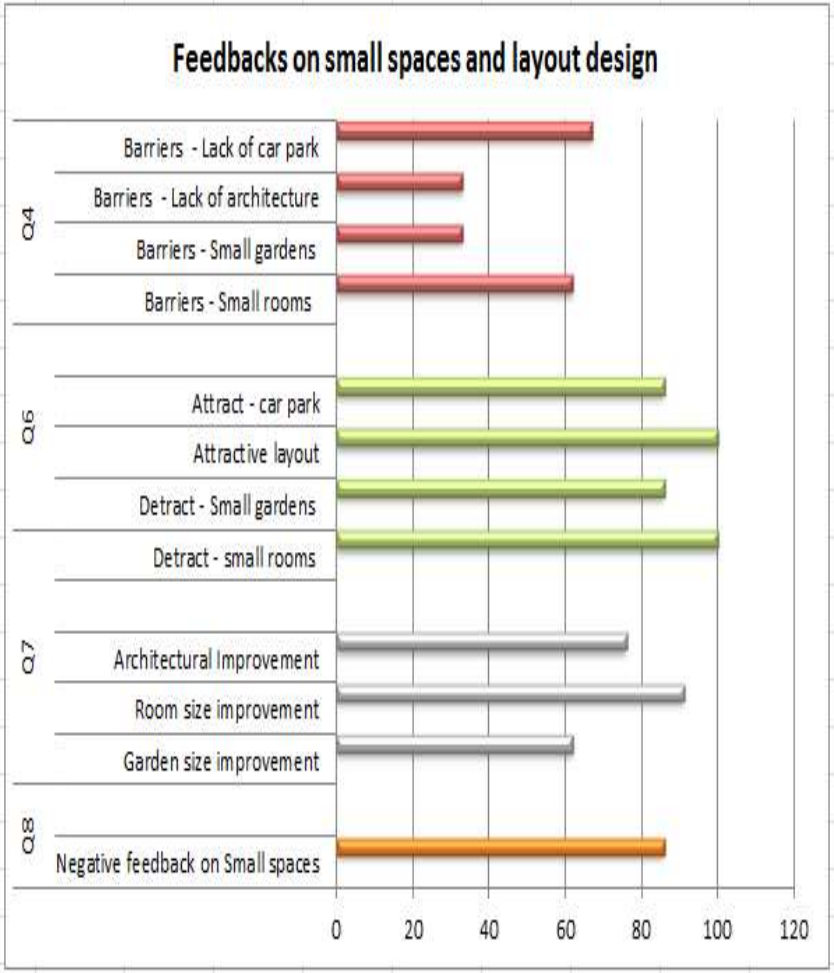
	Very Good	Good	OK	Poor	Very Poor
o Architecture characteristic (Identity)					
o Material					
o Internal spaces					
o Cost (affordability)					
o Energy efficiency					
o Garden					
o Outside parking spaces					

7.2.3 (Quantitative analyses) Coding questioner results




1- Interest in new built house or old houses
Prefer new houses -age below 50
Prefer old houses -age above 50
First time buyers
Non first time buyers
Investment
Gov Scheme
Marketing tool
Personal intrest
Customers prefer old house
Customers prefer new house
Agents prefer old house
Agents prefer new house
0
10
20
30
40
50
60
70
80
Interest in new built house or old houses
Prefer new houses -age below 50
Prefer old houses -age above 50
First time buyers
Non first time buyers
Investment
Gov Scheme
Marketing tool
Personal intrest
Customers prefer old house
Customers prefer new house
Customers prefer new house
Customers prefer old house
First time buyers
Non first time buyers
Personal intrest
Marketing tool
Gov Scheme
Investment
0
20
40
60
80
Q9 Agents p 38
Agents p 62
Q5 Custome 33
Custome 67
Q3 Personal 34
Marketin 17
Gov Sche 49
Q2 Investme 20
Non first 30
First time 50
Q1 Prefer old houses - age above 25
Prefer new houses - age below 75

Q8	Negative feedback on Small sp	86
Q7	Garden size improvement	62
	Room size improvement	91
	Architectural Improvement	76
	Detract - small rooms	100
Q6	Detract - Small gardens	86
	Attractive layout	100
	Attract - car park	86
Q4	Barriers - Small rooms	62
	Barriers - Small gardens	33
	Barriers - Lack of architecture	33
	Barriers - Lack of car park	67



7.2.4 Visual Analyse Method

This i

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the thesis can be found in the Lanchester Library, Coventry University

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7.2.5 Questioner Samples

Coventry University

OPTIMISING THE DESIGN OF NEW HOUSING IN THE UK

As we know most of the British houses designed as some of the smallest, most expensive and most energy profligate housing in Europe, UK developers still replicating the post war housing design, layout and materials for the new housing developments, then the question would be **'Why UK property developers design the houses the way they do?'** This study aims to consider your view to improve the design of new build houses in the UK and identify the barriers preventing UK housing developers from change.

NOTE/ New build houses are (Houses being built in the last 15 years)

1. What percentage of people asking to purchase or rent a new build house?

- o Aged below 50 years old 75 %
- o Aged above 50 years old 25%

Any comments
younger people are finding it easier to buy newer build homes with a 5%. deposit + a 5 year 'rent free loan from the government'

2. Do you sell most of the new build houses to?

- o First time buyers 50 %
- o Non first time buyers 25 %
- o Investment property buyers 25 %

Any comments

3. Do you sell most of the new build houses to First Time Buyers because of?

- o Government first time buyer scheme is only for new build homes ...
- o Developers marketing tool such as choice of flooring, kitchen style, car ...
- (o) Personal interest of buying a new house just because it is new ...

4. Any difficulties or specific barriers to sell or rent out a new build house?

		1 Very Important	2 Less important	3 NOT important
1	o Cost (affordability)	☑	☐	☐
2	o Lack of architecture	☐	☐	☑
3	o Lack of car park	☐	☑	☐
4	o Small room size	☐	☑	☐
5	o Quality of materials	☐	☐	☑
6	o Small size gardens	☐	☐	☑
7	o Others (please specify)			

5. **Do you think most of the customers prefer to live in a new build houses or an old house if the COST is not the barrier?**
   - o Customers prefer to live in a new build houses 25 %
   - o Customers prefer to live in an old house 75-100 %

6. **Any specific features ATTRACT or DETRACT the customer to buy or rent a new build house?**

		1 ATTRACT	2 DETRACT
1	A cellar or Basement	☑	☐
2	Flat roof	☐	☑
3	Internal Spaces layout	☐	☑
4	Private car park	☐	☑
5	Advanced Technology	☑	☐
6	House appearance	☑	☐
7	Warranty	☑	☐
8	Small rooms	☐	☑
9	Small garden	☐	☑
10	Quality of materials	☐	☑
11	Narrow house front	☐	☑
12	Lack of architectural characteristic or identity	☐	☑
13	Others (please specify)		

7. **How British houses can be improved?**

		1 Very Important	2 Less important	3 NOT important
1	Architecturally	☑	☐	☐
2	Materials quality	☑	☐	☐
3	Energy efficiency	☑	☐	☐
4	Larger rooms	☑	☐	☐
5	Larger garden	☑	☐	☐
6	Cost	☑	☐	☐
7	Larger spaces for car - parking and wheelie bins	☑	☐	☐
	Others (please specify)			

8. **Do you get any feedback from your customers on?**
   - o Design
   - o Maintenance
   - o Material quality
   - o Spaces NO
   - o Energy
   - o Others (please specify)
   - o Are you aware of any comments which are related to the culture origin of the buyer?

Any comments

Now it is all about you!

9. Do you live in an old house or a new build house?

- ○ Old house
- ◉ New build house (circled)

10. If you live in an old house WHY you didn't buy or rent a new build house?

	Very Important	Less important	NOT important
○ Expensive to buy or to rent	☐	☐	☐
○ Expensive to run	☐	☐	☐
○ Small rooms	☐	☐	☐
○ Small garden	☐	☐	☐
○ Low quality materials	☐	☐	☐
○ Lack of spaces for car parking and wheelie bins	☐	☐	☐
	☐	☐	☐
○ Others (please specify)			

11. Do you think we are providing enough good quality houses in term of?

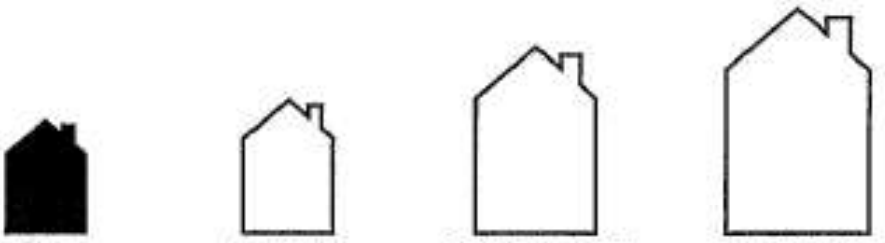
	Very Good	Good	OK	Poor	Very Poor
○ Architecture characteristic (Identity)	☐	☐	☐	☐	☑
○ Material	☐	☐	☐	☐	☑
○ Internal spaces	☐	☐	☐	☐	☑
○ Cost (affordability)	☐	☐	☐	☐	☑
○ Energy efficiency	☑	☐	☐	☐	☐
○ Garden	☐	☐	☐	☐	☑
○ Outside parking spaces	☐	☐	☐	☐	☑

Any extra comments:

Homes should continue to be built like an old build property
Fire place
Solid walls
No Service charge as people are more than capable of sweeping & trimming the grass.

ARAZ AGHA / Coventry University / Department of Civil Engineering, Architecture & Building
John Laing Building , Much Park Street, CV1 2LT, Coventry , Room:JL131
Email- ab4146@coventry.ac.uk Mobil No: 077 429 86008 Office No: 02477657950

OPTIMISING THE DESIGN OF NEW HOUSING IN THE UK



UK

The average new home is 76m²

IRELAND
15% BIGGER

The average new home is 87.7m²

NETHERLANDS
53% BIGGER

The average new home is 115.5m²

DENMARK
80% BIGGER

The average new home is 137m²

(HOMEWISE,2013)

Coventry University

OPTIMISING THE DESIGN OF NEW HOUSING IN THE UK

As we know most of the British houses designed as some of the smallest, most expensive and most energy profligate housing in Europe, UK developers still replicating the post war housing design, layout and materials for the new housing developments, then the question would be **'Why UK property developers design the houses the way they do?'** This study aims to consider your view to improve the design of new build houses in the UK and identify the barriers preventing UK housing developers from change.

NOTE/ New build houses are (Houses being built in the last 15 years)

1. What percentage of people asking to purchase or rent a new build house?

1 ○ Aged below 50 years old 35 %
2 ○ Aged above 50 years old 65 %

Any comments

2. Do you sell most of the new build houses to? scale 1 — 10

1 ○ First time buyers 10 %
2 ○ Non first time buyers 30 %
3 ○ Investment property buyers 60 %

Any comments

3. Do you sell most of the new build houses to First Time Buyers because of?

1 ○ Government first time buyer scheme is only for new build homes ...
2 ○ Developers marketing tool such as choice of flooring, kitchen style, car ...
3 ✓ Personal interest of buying a new house just because it is new ...

4. Any difficulties or specific barriers to sell or rent out a new build house?

	Very important	Less important	NOT important
1 ○ Cost (affordability)	✓		
2 ○ Lack of architecture			
3 ○ Lack of car park		✓	
4 □ Small room size	✓		
5 ○ Quality of materials		✓	
6 ○ Small size gardens	✓		
7 ○ Others (please specify)			✓

5. **Do you think most of the customers prefer to live in a new build houses or an old house if the COST is not the barrier?**

1 ○ Customers prefer to live in a new build houses 50 %

2 ○ Customers prefer to live in an old house 50 %

6. **Any specific features ATTRACT or DETRACT the customer to buy or rent a new build house?**

		1 ATTRACT	2 DETRACT
1	○ A cellar or Basement	☐	☑
2	○ Flat roof	☐	☑
3	○ Internal Spaces layout	☑	☐
4	○ Private car park	☑	☐
5	○ Advanced Technology	☑	☐
6	○ House appearance	☑	☐
7	○ Warranty	☑	☐
8	○ Small rooms	☐	☑
9	○ Small garden	☐	☑
10	○ Quality of materials	☑	☐
11	○ Narrow house front	☐	☑
12	○ Lack of architectural characteristic or identity	☐	☑
13	○ Others (please specify)		

7. **How British houses can be improved?**

	Very Important	Less important	NOT important
○ Architecturally	☑	☐	☐
○ Materials quality	☐	☑	☐
○ Energy efficiency	☑	☐	☐
○ Larger rooms	☑	☐	☐
○ Larger garden	☑	☐	☐
○ Cost	☑	☐	☐
○ Larger spaces for car - parking and wheelie bins	☑	☐	☐
○ Others (please specify)			

8. **Do you get any feedback from your customers on?**

○ Design

○ Maintenance

○ Material quality

○ Spaces

○ Energy

○ Others (please specify)

○ Are you aware of any comments which are related to the **culture origin** of the buyer?

Any comments

2

Now it is all about you!

9. Do you live in an old house or a new build house?

- o Old house
- ✓ New build house

10. If you live in an old house WHY you didn't buy or rent a new build house?

	Very Important	Less Important	NOT Important
o Expensive to buy or to rent			
o Expensive to run			
o Small rooms			
o Small garden			
o Low quality materials			
o Lack of spaces for car parking and wheelie bins			
o Others (please specify)			

11. Do you think we are providing enough good quality houses in term of?

	Very Good	Good	OK	Poor	Very Poor
o Architecture characteristic (identity)					
o Material					
o Internal spaces					
o Cost (affordability)					
o Energy efficiency					
o Garden					
o Outside parking spaces					

Any extra comments:

ARAZ AGHA / Coventry University / Department of Civil Engineering, Architecture & Building

John Laing Building , Much Park Street, CV1 2LT, Coventry , Room:JL131

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(HOMEWISE,2013)

3

Coventry University

OPTIMISING THE DESIGN OF NEW HOUSING IN THE UK

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NOTE: New build houses are (Houses being built in the last 15 years)

1. What percentage of people asking to purchase or rent a new build house?

- o Aged below 50 years old 75 %
- o Aged above 50 years old 25%

Any comments

2. Do you sell most of the new build houses to?

- o First time buyers 50 %
- o Non first time buyers 25 %
- o Investment property buyers 25 %

Any comments

3. Do you sell most of the new build houses to First Time Buyers because of?

- o Government first time buyer scheme is only for new build homes ...
- o Developers marketing tool such as choice of flooring, kitchen style, car ...
- o Personal interest of buying a new house just because it is new ...

4. Any difficulties or specific barriers to sell or rent out a new build house?

	1 Very Important	2 Less important	3 NOT important
1 o Cost (affordability)	☑	☐	☐
2 o Lack of architecture	☑	☐	☐
3 o Lack of car park	☑	☐	☐
4 o Small room size	☑	☐	☐
5 o Quality of materials	☐	☑	☐
6 o Small size gardens	☐	☑	☐
7 o Others (please specify)			

5. **Do you think most of the customers prefer to live in a new build houses or an old house if the COST is not the barrier?**
   - o Customers prefer to live in a new build houses 25 %
   - o Customers prefer to live in an old house 75 %

6. **Any specific features ATTRACT or DETRACT the customer to buy or rent a new build house?**

		1 ATTRACT	2 DETRACT
1	o A cellar or Basement	☑	☐
2	o Flat roof	☐	☑
3	o Internal Spaces layout	☐	☑
4	o Private car park	☑	☐
5	o Advanced Technology	☐	☑
6	o House appearance	☑	☐
7	o Warranty	☑	☐
8	o Small rooms	☐	☑
9	o Small garden	☐	☑
10	o Quality of materials	☑	☐
11	o Narrow house front	☐	☑
12	o Lack of architectural characteristic or identity	☐	☑
	o Others (please specify)		

7. **How British houses can be improved?**

	Very Important	Less important	NOT Important
o Architecturally	☑	☐	☐
o Materials quality	☑	☐	☐
o Energy efficiency	☑	☐	☐
o Larger rooms	☑	☐	☐
o Larger garden	☑	☐	☐
o Cost	☑	☐	☐
o Larger spaces for car - parking and wheelie bins	☑	☐	☐
o Others (please specify)			

8. **Do you get any feedback from your customers on?**
   - o Design
   - o Maintenance
   - o Material quality
   - ☑ Spaces
   - o Energy
   - o Others (please specify) Car Parking
   - o Are you aware of any comments which are related to the **culture origin** of the buyer?

Any comments

Now it is all about you!

9. Do you live in an old house or a new build house?

- ○ Old house
- ○ New build house

10. If you live in an old house WHY you didn't buy or rent a new build house?

	Very Important	Less Important	NOT Important
○ Expensive to buy or to rent	☑	☐	☐
○ Expensive to run	☐	☑	☐
○ Small rooms	☑	☐	☐
○ Small garden	☑	☐	☐
○ Low quality materials	☐	☑	☐
○ Lack of spaces for car parking and wheelie bins	☑	☐	☐
○ Others (please specify)	☐	☐	☐

11. Do you think we are providing enough good quality houses in term of?

	Very Good	Good	OK	Poor	Very Poor
○ Architecture characteristic (Identity)	☐	☐	☐	☐	☑
○ Material	☐	☐	☐	☐	☑
○ Internal spaces	☐	☐	☐	☐	☑
○ Cost (affordability)	☐	☐	☐	☐	☑
○ Energy efficiency	☑	☐	☐	☐	☐
○ Garden	☐	☐	☐	☐	☐
○ Outside parking spaces	☐	☐	☐	☐	☑

Any extra comments:

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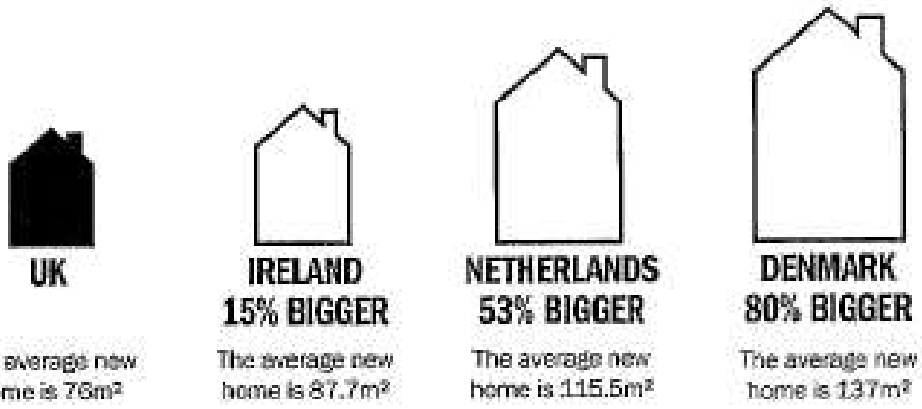

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(HOMEWISE, 2013)

4

Coventry University

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NOTE/ New build houses are (Houses being built in the last 15 years)

1. **What percentage of people asking to purchase or rent a new build house?**

- Aged below 50 years old 70 %
- Aged above 50 years old 30 %

Any comments

2. **Do you sell most of the new build houses to?**

- First time buyers 20 %
- Non first time buyers 50%
- Investment property buyers 20 %

Any comments

3. **Do you sell most of the new build houses to First Time Buyers because of?**

- Government first time buyer scheme is only for new build homes …
- Developers marketing tool such as choice of flooring, kitchen style, car …
- Personal interest of buying a new house just because it is new …

N/A We only see second hand homes'

4. **Any difficulties or specific barriers to sell or rent out a new build house?**

		1 Very Important	2 Less important	3 NOT important
1	Cost (affordability)	☑	☐	☐
2	Lack of architecture	☐	☑	☐
3	Lack of car park	☑	☐	☐
4	Small room size	☐	☑	☐
5	Quality of materials	☐	☑	☐
6	Small size gardens	☐	☑	☐
7	Others (please specify)			

5. **Do you think most of the customers prefer to live in a new build houses or an old house if the COST is not the barrier?**
   - o Customers prefer to live in a new build houses 40 %
   - o Customers prefer to live in an old house 60 %

6. **Any specific features ATTRACT or DETRACT the customer to buy or rent a new build house?**

		1 ATTRACT	2 DETRACT
1	o A cellar or Basement	☐	☑
2	o Flat roof	☐	☑
3	o Internal Spaces layout	☑	☐
4	o Private car park	☑	☐
5	o Advanced Technology	☑	☐
6	o House appearance	☑	☐
7	o Warranty	☑	☐
8	o Small rooms	☐	☑
9	o Small garden	☐	☑
10	o Quality of materials	☑	☐
11	o Narrow house front	☐	☑
12	o Lack of architectural characteristic or identity	☐	☑
	o Others (please specify)		

7. **How British houses can be improved?**

	Very Important	Less important	NOT important
o Architecturally	☑	☐	☐
o Materials quality	☐	☑	☐
o Energy efficiency	☐	☑	☐
o Larger rooms	☐	☑	☐
o Larger garden	☐	☑	☐
o Cost	☑	☐	☐
o Larger spaces for car - parking and wheelie bins	☑	☐	☐
o Others (please specify)			

8. **Do you get any feedback from your customers on?**
   - o Design ✓
   - o Maintenance
   - o Material quality ✓
   - o Spaces ✓
   - o Energy ✓
   - o Others (please specify)
   - o Are you aware of any comments which are related to the culture origin of the buyer? none.

Any comments

Now it is all about you!

9. Do you live in an old house or a new build house?

- ○ Old house
- ○ New build house

10. If you live in an old house WHY you didn't buy or rent a new build house?

	Very Important	Less Important	NOT Important
○ Expensive to buy or to rent	☐	☐	☑
○ Expensive to run	☐	☐	☑
○ Small rooms	☑	☐	☐
○ Small garden	☑	☐	☐
○ Low quality materials	☑	☐	☐
○ Lack of spaces for car parking and wheelie bins	☑	☐	☐
○ Others (please specify)	☐	☐	☐

11. Do you think we are providing enough good quality houses in term of?

	Very Good	Good	OK	Poor	Very Poor
○ Architecture characteristic (Identity)	☐	☐	☑	☐	☐
○ Material	☐	☑	☐	☐	☐
○ Internal spaces	☐	☐	☑	☐	☐
○ Cost (affordability)	☐	☐	☑	☐	☐
○ Energy efficiency	☐	☑	☐	☐	☐
○ Garden	☐	☐	☐	☑	☐
○ Outside parking spaces	☐	☐	☑	☐	☐

Any extra comments:

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(HOMEWISE,2013)

5

Coventry University

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NOTE/ New build houses are (Houses being built in the last 15 years)

1. **What percentage of people asking to purchase or rent a new build house?**

- Aged below 50 years old 90 %
- Aged above 50 years old 10 %

Any comments

2. **Do you sell most of the new build houses to?**

- First time buyers 33 %
- Non first time buyers 33 %
- Investment property buyers 33 %

Any comments

3. **Do you sell most of the new build houses to First Time Buyers because of?**

- Government first time buyer scheme is only for new build homes …
- Developers marketing tool such as choice of flooring, kitchen style, car …
- ✓ Personal interest of buying a new house just because it is new …

4. **Any difficulties or specific barriers to sell or rent out a new build house?**

	1 Very Important	2 Less important	3 NOT important
1 Cost (affordability)	✓		
2 Lack of architecture		✓	
3 Lack of car park		✓	
4 Small room size		✓	
5 Quality of materials			✓
6 Small size gardens		✓	
7 Others (please specify)			

5. **Do you think most of the customers prefer to live in a new build houses or an old house if the COST is not the barrier?**
   - o Customers prefer to live in a new build houses 50 %
   - o Customers prefer to live in an old house 50 %

6. **Any specific features ATTRACT or DETRACT the customer to buy or rent a new build house?**

	ATTRACT	DETRACT
1 o A cellar or Basement	N/A	
2 o Flat roof		✓
3 o Internal Spaces layout	N/A	
4 o Private car park	✓	
5 o Advanced Technology	N/A	
6 o House appearance	N/A	
7 o Warranty	✓	
8 o Small rooms		✓
9 o Small garden		
10 o Quality of materials	N/A	
11 o Narrow house front	N/A	
12 o Lack of architectural characteristic or identity	N/A	
13 o Others (please specify)		

7. **How British houses can be improved?**

	Very Important	Loss important	NOT important
o Architecturally		✓	
o Materials quality		✓	
o Energy efficiency		✓	
o Larger rooms		✓	
o Larger garden		✓	
o Cost	✓		
o Larger spaces for car - parking and wheelie bins		✓	
o Others (please specify)			

8. **Do you get any feedback from your customers on?**
   - o ✓ Design
   - o ✓ Maintenance
   - o ✓ Material quality
   - o ✓ Spaces
   - o Energy
   - o Others (please specify)
   - o Are you aware of any comments which are related to the **culture origin** of the buyer? No

Any comments

Now it is all about you!

9. Do you live in an old house or a new build house?

- o Old house
- o New build house ✓

10. If you live in an old house WHY you didn't buy or rent a new build house?

	Very Important	Less Important	NOT important
o Expensive to buy or to rent	☐	☐	☐
o Expensive to run	☐	☐	☐
o Small rooms	☐	☐	☐
o Small garden	☐	☐	☐
o Low quality materials	☐	☐	☐
o Lack of spaces for car parking and wheelie bins	☐	☐	☐
o Others (please specify)	☐	☐	☐

11. Do you think we are providing enough good quality houses in term of?

	Very Good	Good	OK	Poor	Very Poor
o Architecture characteristic (Identity)	☐	☐	☑	☐	☐
o Material	☐	☐	☑	☐	☐
o Internal spaces	☐	☐	☑	☐	☐
o Cost (affordability)	☐	☐	☐	☑	☐
o Energy efficiency	☐	☑	☐	☐	☐
o Garden	☐	☐	☑	☐	☐
o Outside parking spaces	☐	☐	☐	☑	☐

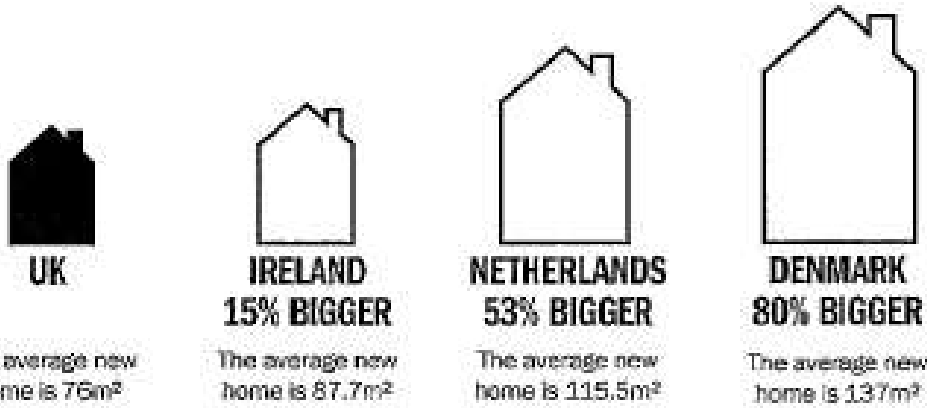
Any extra comments:

ARAZ AGHA / Coventry University / Department of Civil Engineering, Architecture & Building

John Laing Building , Much Park Street, CV1 2LT, Coventry , Room:JL131

Email- ab4146@coventry.ac.uk Mobil No: 077 429 86008 Office No: 02477657950

OPTIMISING THE DESIGN OF NEW HOUSING IN THE UK



UK

The average new home is 76m²

IRELAND
15% BIGGER

The average new home is 87.7m²

NETHERLANDS
53% BIGGER

The average new home is 115.5m²

DENMARK
80% BIGGER

The average new home is 137m²

(HOMEWISE,2013)

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Coventry University

OPTIMISING THE DESIGN OF NEW HOUSING IN THE UK

As we know most of the British houses designed as some of the smallest, most expensive and most energy profligate housing in Europe, UK developers still replicating the post war housing design, layout and materials for the new housing developments, then the question would be **'Why UK property developers design the houses the way they do?'** This study aims to consider your view to improve the design of new build houses in the UK and identify the barriers preventing UK housing developers from change.

NOTE/ New build houses are (Houses being built in the last 15 years)

1. What percentage of people asking to purchase or rent a new build house?

- ✓ Aged below 50 years old 80 %
- ○ Aged above 50 years old 20 %

Any comments
MOSTLY FIRST TIME BUYERS OR COUPLES WITH SOLD JOBS.

2. Do you sell most of the new build houses to?

- ✓ First time buyers 40 %
- ○ Non first time buyers 50 %
- ○ Investment property buyers 10 %

Any comments

3. Do you sell most of the new build houses to First Time Buyers because of?

- ○ Government first time buyer scheme is only for new build homes ...
- ○ Developers marketing tool such as choice of flooring, kitchen style, car ...
- ✓ Personal interest of buying a new house just because it is new ...

4. Any difficulties or specific barriers to sell or rent out a new build house?

		1 Very Important	2 Less important	3 NOT important
1	○ Cost (affordability)	☑	☐	☐
2	○ Lack of architecture	☐	☐	☑
3	○ Lack of car park	☑	☐	☐
4	○ Small room size	☐	☑	☐
5	○ Quality of materials	☐	☐	☑
6	○ Small size gardens	☐	☐	☑
7	○ Others (please specify)			

5. **Do you think most of the customers prefer to live in a new build houses or an old house if the COST is not the barrier?**

- Customers prefer to live in a new build houses 60 %
- Customers prefer to live in an old house 40 %

6. **Any specific features ATTRACT or DETRACT the customer to buy or rent a new build house?**

	ATTRACT	DETRACT
A cellar or Basement	☑	☐
Flat roof	☐	☑
Internal Spaces layout	☑	☐
Private car park	☑	☐
Advanced Technology	☑	☐
House appearance	☑	☐
Warranty	☑	☐
Small rooms	☐	☑
Small garden	☐	☑
Quality of materials	☐	☑
Narrow house front	☐	☑
Lack of architectural characteristic or identity	☐	☑
Others (please specify)		

7. **How British houses can be improved?**

	Very Important	Less Important	NOT Important
Architecturally	☑	☐	☐
Materials quality	☑	☐	☐
Energy efficiency	☐	☑	☐
Larger rooms	☑	☐	☐
Larger garden	☑	☐	☐
Cost	☑	☐	☐
Larger spaces for car - parking and wheelie bins	☑	☐	☐
Others (please specify)			

8. **Do you get any feedback from your customers on?**

- Design
- Maintenance
- Material quality
- ☑ Spaces
- Energy
- Others (please specify)
- Are you aware of any comments which are related to the culture origin of the buyer?

Any comments

Low maintenance, Easy living and with cultural appeal

Now it is all about you!

6

9. Do you live in an old house or a new build house?

- ○ Old house
- ✓ New build house

10. If you live in an old house WHY you didn't buy or rent a new build house?

	Very Important	Less important	NOT important
○ Expensive to buy or to rent	☐	☐	☐
○ Expensive to run	☐	☐	☐
○ Small rooms	☐	☐	☐
○ Small garden	☐	☐	☐
○ Low quality materials	☐	☐	☐
○ Lack of spaces for car parking and wheelie bins	☐	☐	☐
○ Others (please specify)	☐	☐	☐

11. Do you think we are providing enough good quality houses in term of?

	Very Good	Good	OK	Poor	Very Poor
○ Architecture characteristic (Identity)	☐	✓	☐	☐	☐
○ Material	☐	☐	☐	✓	☐
○ Internal spaces	☐	☐	☐	✓	☐
○ Cost (affordability)	☐	☐	☐	✓	☐
○ Energy efficiency	☐	✓	☐	☐	☐
○ Garden	☐	☐	✓	☐	☐
○ Outside parking spaces	☐	☐	☐	✓	☐

Any extra comments:

ARAZ AGHA / Coventry University / Department of Civil Engineering, Architecture & Building

John Laing Building , Much Park Street, CV1 2LT, Coventry , Room:JL131

Email- ab4146@coventry.ac.uk Mobil No: 077 429 86008 Office No: 02477657950

Coventry University

OPTIMISING THE DESIGN OF NEW HOUSING IN THE UK

As we know most of the British houses designed as some of the smallest, most expensive and most energy profligate housing in Europe, UK developers still replicating the post war housing design, layout and materials for the new housing developments, then the question would be **'Why UK property developers design the houses the way they do?'** This study aims to consider your view to improve the design of new build houses in the UK and identify the barriers preventing UK housing developers from change.

NOTE/ New build houses are (Houses being built in the last 15 years)

1. **What percentage of people asking to purchase or rent a new build house?**

- o Aged below 50 years old 75 %
- o Aged above 50 years old 25 %

Any comments

2. **Do you sell most of the new build houses to?**

- o First time buyers 20 %
- o Non first time buyers 30 %
- o Investment property buyers %

Any comments

3. **Do you sell most of the new build houses to First Time Buyers because of?**

- ✓ Government first time buyer scheme is only for new build homes …
- o Developers marketing tool such as choice of flooring, kitchen style, car …
- ✓ Personal interest of buying a new house just because it is new …

4. **Any difficulties or specific barriers to sell or rent out a new build house?**

		1 Very Important	2 Less important	3 NOT important
1	o Cost (affordability)	☑	☐	☐
2	o Lack of architecture	☐	☑	☐
3	o Lack of car park	☑	☐	☐
4	o Small room size	☐	☑	☐
5	o Quality of materials	☑	☐	☐
6	o Small size gardens	☐	☑	☐
7	o Others (please specify)			

5. **Do you think most of the customers prefer to live in a new build houses or an old house if the COST is not the barrier?**
   - o Customers prefer to live in a new build houses 40 %
   - o Customers prefer to live in an old house 25 %

6. **Any specific features ATTRACT or DETRACT the customer to buy or rent a new build house?**

		1 ATTRACT	2 DETRACT
1	o A cellar or Basement	☐	☑
2	o Flat roof	☐	☑
3	o Internal Spaces layout	☑	☐
4	o Private car park	☑	☐
5	o Advanced Technology	☑	☐
6	o House appearance	☑	☐
7	o Warranty	☑	☐
8	o Small rooms	☐	☑
9	o Small garden	☐	☑
10	o Quality of materials	☑	☐
11	o Narrow house front	☐	☑
12	o Lack of architectural characteristic or identity	☐	☑
	o Others (please specify)		

7. **How British houses can be improved?**

	Very Important	Less important	NOT important
o Architecturally	☐	☑	☐
o Materials quality	☑	☐	☐
o Energy efficiency	☑	☐	☐
o Larger rooms	☑	☐	☐
o Larger garden	☑	☐	☐
o Cost	☑	☐	☐
o Larger spaces for car - parking and wheelie bins	☑	☐	☐
o Others (please specify)			

8. **Do you get any feedback from your customers on?**
   - o Design
   - 9 Maintenance
   - o Material quality
   - 9 Spaces
   - 9 Energy
   - o Others (please specify)
   - o Are you aware of any comments which are related to the **culture origin** of the buyer?

Any comments

Now it is all about you!

9. Do you live in an old house or a new build house?

- Old house
- ✓ New build house

10. If you live in an old house WHY you didn't buy or rent a new build house?

	Very Important	Less important	NOT important
Expensive to buy or to rent	☐	☐	☐
Expensive to run	☐	☐	☐
Small rooms	☐	☐	☐
Small garden	☐	☐	☐
Low quality materials	☐	☐	☐
Lack of spaces for car parking and wheelie bins	☐	☐	☐
Others (please specify)	☐	☐	☐

11. Do you think we are providing enough good quality houses in term of?

	Very Good	Good	OK	Poor	Very Poor
Architecture characteristic (Identity)	☐	☐	✓	☐	☐
Material	☐	✓	☐	☐	☐
Internal spaces	☐	✓	☐	☐	☐
Cost (affordability)	☐	✓	☐	☐	☐
Energy efficiency	☐	✓	☐	☐	☐
Garden	☐	✓	☐	☐	☐
Outside parking spaces	☐	✓	☐	☐	☐

Any extra comments:

ARAZ AGHA / Coventry University / Department of Civil Engineering, Architecture & Building

John Laing Building , Much Park Street, CV1 2LT, Coventry , Room:JL131

Email- ab4146@coventry.ac.uk Mobil No: 077 429 86008 Office No: 02477657950

Croydon London

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Coventry University

OPTIMISING THE DESIGN OF NEW HOUSING IN THE UK

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NOTE/ New build houses are (Houses being built in the last 15 years)

1. What percentage of people asking to purchase or rent a new build house?

- o Aged below 50 years old 50 %
- o Aged above 50 years old 50 %

Any comments

2. Do you sell most of the new build houses to?

- o First time buyers 50 %
- o Non first time buyers 30 %
- o Investment property buyers 20 %

Any comments

3. Do you sell most of the new build houses to First Time Buyers because of?

- ✓ Government first time buyer scheme is only for new build homes ...
- ✓ Developers marketing tool such as choice of flooring, kitchen style, car ...
- o Personal interest of buying a new house just because it is new ...

4. Any difficulties or specific barriers to sell or rent out a new build house?

		1 Very Important	2 Less Important	3 NOT Important
1	o Cost (affordability)	☑	☐	☐
2	o Lack of architecture	☑	☐	☐
3	o Lack of car park	☑	☐	☐
5	o Small room size	☑	☐	☐
4,5	o Quality of materials	☑	☐	☐
6	o Small size gardens	☑	☐	☐
7	o Others (please specify)			

5. **Do you think most of the customers prefer to live in a new build houses or an old house if the COST is not the barrier?**
   - o Customers prefer to live in a new build houses 30 %
   - o Customers prefer to live in an old house 70 %

6. **Any specific features ATTRACT or DETRACT the customer to buy or rent a new build house?**

	ATTRACT	DETRACT
1 o A cellar or Basement	☑	☐
2 o Flat roof	☐	☑
3 o Internal Spaces layout	☑	☐
4 o Private car park	☑	☐
5 o Advanced Technology	☑	☐
6 o House appearance	☑	☐
7 o Warranty	☑	☐
8 o Small rooms	☐	☑
9 o Small garden	☐	☑
10 o Quality of materials	☑	☐
11 o Narrow house front	☐	☑
12 o Lack of architectural characteristic or identity	☐	☑
o Others (please specify)		

7. **How British houses can be improved?**

	Very Important	Less important	NOT important
o Architecturally	☑	☐	☐
o Materials quality	☑	☐	☐
o Energy efficiency	☑	☐	☐
o Larger rooms	☐	☐	☐
o Larger garden	☑	☐	☐
o Cost	☑	☐	☐
o Larger spaces for car - parking and wheelie bins	☑	☐	☐
o Others (please specify)			

8. **Do you get any feedback from your customers on?**
   - o Design
   - o Maintenance
   - o Material quality
   - ✓ Spaces
   - o Energy
   - o Others (please specify)
   - o Are you aware of any comments which are related to the **culture origin** of the buyer?

Any comments

Now it is all about you!

9. **Do you live in an old house or a new build house?**

- ○ Old house
- ○ New build house

10. **If you live in an old house WHY you didn't buy or rent a new build house?** N/A

	Very Important	Less Important	NOT important
○ Expensive to buy or to rent	☐	☐	☐
○ Expensive to run	☐	☐	☐
○ Small rooms	☐	☐	☐
○ Small garden	☐	☐	☐
○ Low quality materials	☐	☐	☐
○ Lack of spaces for car parking and wheelie bins	☐	☐	☐
○ Others (please specify)	☐	☐	☐

11. **Do you think we are providing enough good quality houses in term of?**

	Very Good	Good	OK	Poor	Very Poor
○ Architecture characteristic (Identity)	☐	☐	☐	☑	☐
○ Material	☐	☐	☐	☑	☐
○ Internal spaces	☐	☐	☐	☑	☐
○ Cost (affordability)	☐	☐	☑	☐	☐
○ Energy efficiency	☐	☐	☑	☐	☐
○ Garden	☐	☐	☐	☑	☐
○ Outside parking spaces	☐	☐	☐	☑	☐

Any extra comments:

ARAZ AGHA / Coventry University / Department of Civil Engineering, Architecture & Building

John Laing Building , Much Park Street, CV1 2LT, Coventry , Room:JL131

Email- ab4146@coventry.ac.uk Mobil No: 077 429 86008 Office No: 02477657950

9

OPTIMISING THE DESIGN OF NEW HOUSING IN THE UK

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NOTE/ New build houses are (Houses being built in the last 15 years)

1. **What percentage of people asking to purchase or rent a new build house?**

- Aged below 50 years old 60 %
- Aged above 50 years old 40 %

Any comments

2. **Do you sell most of the new build houses to?**

- First time buyers 40 %
- Non first time buyers 30 %
- Investment property buyers 30 %

Any comments

3. **Do you sell most of the new build houses to First Time Buyers because of?**

- Government first time buyer scheme is only for new build homes …
- Developers marketing tool such as choice of flooring, kitchen style, car … YES
- Personal interest of buying a new house just because it is new …

4. **Any difficulties or specific barriers to sell or rent out a new build house?**

		1 Very Important	2 Less important	3 NOT important
1	Cost (affordability)	☑	☐	☐
2	Lack of architecture	☐	☐	☑
3	Lack of car park	☐	☑	☐
4	Small room size	☑	☐	☐
5	Quality of materials	☑	☐	☐
6	Small size gardens	☐	☑	☐
7	Others (please specify)			

5. **Do you think most of the customers prefer to live in a new build houses or an old house if the COST is not the barrier?**
   - Customers prefer to live in a new build houses 60 %
   - Customers prefer to live in an old house 40 %

6. **Any specific features ATTRACT or DETRACT the customer to buy or rent a new build house?**

	ATTRACT	DETRACT
A cellar or Basement	☑	☐
Flat roof	☐	☑
Internal Spaces layout	☐	☑
Private car park	☑	☐
Advanced Technology	☑	☐
House appearance	☑	☐
Warranty	☑	☐
Small rooms	☐	☑
Small garden	☐	☑
Quality of materials	☐	☑
Narrow house front	☐	☑
Lack of architectural characteristic or identity	☐	☑
Others (please specify)		

7. **How British houses can be improved?**

	Very Important	Less important	NOT important
Architecturally	☐	☐	☑
Materials quality	☑	☐	☐
Energy efficiency	☐	☑	☐
Larger rooms	☑	☐	☐
Larger garden	☑	☐	☐
Cost	☑	☐	☐
Larger spaces for car - parking and wheelie bins	☐	☑	☐
Others (please specify)			

8. **Do you get any feedback from your customers on?**
   - Design ✓
   - Maintenance
   - Material quality ✓
   - Spaces ✓
   - Energy
   - Others (please specify)
   - Are you aware of any comments which are related to the **culture origin** of the buyer?

Any comments

Now it is all about you!

9. Do you live in an old house or a new build house?

- o Old house
- o New build house ✓

10. If you live in an old house WHY you didn't buy or rent a new build house?

NOT APPLICABLE

	Very Important	Less important	NOT important
o Expensive to buy or to rent	☐	☐	☐
o Expensive to run	☐	☐	☐
o Small rooms	☐	☐	☐
o Small garden	☐	☐	☐
o Low quality materials	☐	☐	☐
o Lack of spaces for car parking and wheelie bins	☐	☐	☐
o Others (please specify)	☐	☐	☐

11. Do you think we are providing enough good quality houses in term of?

	Very Good	Good	OK	Poor	Very Poor
o Architecture characteristic (Identity)	☐	☐	☐	✓	☐
o Material	☐	✓	☐	☐	☐
o Internal spaces	☐	☐	✓	☐	☐
o Cost (affordability)	☐	☐	✓	☐	☐
o Energy efficiency	☐	✓	☐	☐	☐
o Garden	☐	☐	✓	☐	☐
o Outside parking spaces	☐	✓	☐	☐	☐

Any extra comments:

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Email- ab4146@coventry.ac.uk Mobil No: 077 429 86008 Office No: 02477657950

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Coventry University

OPTIMISING THE DESIGN OF NEW HOUSING IN THE UK

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NOTE/ New build houses are (Houses being built in the last 15 years)

1. **What percentage of people asking to purchase or rent a new build house?**

- o Aged below 50 years old 50 %
- o Aged above 50 years old 50 %

Any comments
THEY DONT TEND TO HAVE ANY PREFERENCE

2. **Do you sell most of the new build houses to?**

- o First time buyers 33 %
- o Non first time buyers 33%
- o Investment property buyers 33%

Any comments
PLEASE SEE PREFERENCE

3. **Do you sell most of the new build houses to First Time Buyers because of?**

- o Government first time buyer scheme is only for new build homes ...
- o Developers marketing tool such as choice of flooring, kitchen style, car ...
- o Personal interest of buying a new house just because it is new ...

4. **Any difficulties or specific barriers to sell or rent out a new build house?**

		1 Very Important	2 Less important	3 NOT important
1	o Cost (affordability)	☑	☐	☐
2	o Lack of architecture	☐	☑	☐
3	o Lack of car park	☑	☐	☐
4	o Small room size	☑	☐	☐
5	o Quality of materials	☑	☐	☐
6	o Small size gardens	☑	☐	☐
7	o Others (please specify)			

5. **Do you think most of the customers prefer to live in a new build houses or an old house if the COST is not the barrier?**
   - o Customers prefer to live in a new build houses 5 %
   - o Customers prefer to live in an old house 95 %

6. **Any specific features ATTRACT or DETRACT the customer to buy or rent a new build house?**

	ATTRACT	DETRACT
o A cellar or Basement	☑	☐
o Flat roof	☐	☑
o Internal Spaces layout	☐	☑
o Private car park	☑	☐
o Advanced Technology	☑	☐
o House appearance	☑	☐
o Warranty	☑	☐
o Small rooms	☐	☑
o Small garden	☐	☑
o Quality of materials	☐	☑
o Narrow house front	☐	☑
o Lack of architectural characteristic or identity	☐	☑
o Others (please specify)		

7. **How British houses can be improved?**

	Very Important	Less important	NOT important
o Architecturally	☑	☐	☐
o Materials quality	☑	☐	☐
o Energy efficiency	☑	☐	☐
o Larger rooms	☑	☐	☐
o Larger garden	☑	☐	☐
o Cost	☑	☐	☐
o Larger spaces for car - parking and wheelie bins	☑	☐	☐
o Others (please specify)			

8. **Do you get any feedback from your customers on?**
   - o Design
   - o Maintenance
   - o Material quality
   - ☑ Spaces
   - o Energy
   - o Others (please specify)
   - o Are you aware of any comments which are related to the **culture origin** of the buyer?

Any comments: Many Comments tend to be - Too small

Now it is all about you!

9. Do you live in an old house or a new build house?

- ○ Old house
- ✓ New build house – But Believe Older Houses are Built Better!

10. If you live in an old house WHY you didn't buy or rent a new build house?

	Very Important	Less Important	NOT important
○ Expensive to buy or to rent	☐	☐	☐
○ Expensive to run	☐	☐	☐
○ Small rooms	☐	☐	☐
○ Small garden	☐	☐	☐
○ Low quality materials	☐	☐	☐
○ Lack of spaces for car parking and wheelie bins	☐	☐	☐
○ Others (please specify)	☐	☐	☐

11. Do you think we are providing enough good quality houses in term of?

	Very Good	Good	OK	Poor	Very Poor
○ Architecture characteristic (Identity)	☐	☐	✓	☐	☐
○ Material	☐	☐	✓	☐	☐
○ Internal spaces	☐	☐	☐	✓	☐
○ Cost (affordability)	☐	☐	✓	☐	☐
○ Energy efficiency	☐	✓	☐	☐	☐
○ Garden	☐	☐	✓	✓	☐
○ Outside parking spaces	☐	☐	✓	☐	☐

Any extra comments:

Because Coventry is a very up and coming student town – the properties we rent out within distance of 2 universities – tend to be both old and modern and the age doesn't seem to matter!
Also due to shortage of 1st time buyer properties – Landlords tend to Unfurnish Any.

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NOTE/ New build houses are (Houses being built in the last 15 years)

1. **What percentage of people asking to purchase or rent a new build house?**

- ✓ Aged below 50 years old 75 %
- o Aged above 50 years old 25 %

Any comments

2. **Do you sell most of the new build houses to?**

- o First time buyers 50 %
- o Non first time buyers 50%
- o Investment property buyers %

Any comments
Mixed selection of FTB investor and non first time buyer.

3. **Do you sell most of the new build houses to First Time Buyers because of?**

- o Government first time buyer scheme is only for new build homes ...
- o Developers marketing tool such as choice of flooring, kitchen style, car ...
- o Personal interest of buying a new house just because it is new ...

4. **Any difficulties or specific barriers to sell or rent out a new build house?**

	1 Very Important	2 Less Important	3 NOT important
1 o Cost (affordability)	☑	☐	☐
2 o Lack of architecture	☐	☑	☐
3 o Lack of car park	☐	☑	☐
4 o Small room size	☑	☐	☐
5 o Quality of materials	☑	☐	☐
6 o Small size gardens	☐	☑	☐
7 o Others (please specify)			

5. **Do you think most of the customers prefer to live in a new build houses or an old house if the COST is not the barrier?**

- ○ Customers prefer to live in a new build houses %
- ✓ Customers prefer to live in an old house 100 %

6. **Any specific features ATTRACT or DETRACT the customer to buy or rent a new build house?**

	ATTRACT	DETRACT
○ A cellar or Basement	☐	☑
○ Flat roof	☐	☑
○ Internal Spaces layout	☑	☐
○ Private car park	☑	☐
○ Advanced Technology	☐	☑
○ House appearance	☑	☐
○ Warranty	☑	☐
○ Small rooms	☐	☑
○ Small garden	☐	☑
○ Quality of materials	☐	☑
○ Narrow house front	☐	☑
○ Lack of architectural characteristic or identity	☐	☑
○ Others (please specify)		

7. **How British houses can be improved?**

	Very important	Less important	NOT important
○ Architecturally	☑	☐	☐
○ Materials quality	☑	☐	☐
○ Energy efficiency	☑	☐	☐
○ Larger rooms	☑	☐	☐
○ Larger garden	☑	☐	☐
○ Cost	☑	☑	☐
○ Larger spaces for car - parking and wheelie bins	☐	☐	☐
○ Others (please specify)			

8. **Do you get any feedback from your customers on?**

- ○ Design
- ○ Maintenance
- ✓ Material quality
- ✓ Spaces
- ○ Energy
- ○ Others (please specify)
- ○ Are you aware of any comments which are related to the **culture origin** of the buyer?

Any comments
Regards

Now it is all about you!

9. Do you live in an old house or a new build house?

- [x] Old house
- [ ] New build house

10. If you live in an old house WHY you didn't buy or rent a new build house?

	Very Important	Less important	NOT important
Expensive to buy or to rent	☐	☐	☑
Expensive to run	☐	☑	☐
Small rooms	☑	☐	☐
Small garden	☑	☐	☐
Low quality materials	☑	☐	☐
Lack of spaces for car parking and wheelie bins	☐	☑	☐
Others (please specify)	☐	☐	☐

11. Do you think we are providing enough good quality houses in term of?

	Very Good	Good	OK	Poor	Very Poor
Architecture characteristic (Identity)	☐	☐	☐	☑	☐
Material	☐	☐	☐	☑	☐
Internal spaces	☐	☐	☐	☑	☐
Cost (affordability)	☐	☐	☐	☑	☐
Energy efficiency	☑	☐	☐	☐	☐
Garden	☐	☐	☐	☑	☐
Outside parking spaces	☐	☐	☐	☑	☐

Any extra comments:

Modern built properties have too many properties built close together.
Too many properties built per site.

ARAZ AGHA / Coventry University / Department of Civil Engineering, Architecture & Building
John Laing Building , Much Park Street, CV1 2LT, Coventry , Room:JL131
Email- ab4146@coventry.ac.uk Mobil No: 077 429 86008 Office No: 02477657950

Croydon London

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Coventry University

OPTIMISING THE DESIGN OF NEW HOUSING IN THE UK

As we know most of the British houses designed as some of the smallest, most expensive and most energy profligate housing in Europe, UK developers still replicating the post war housing design, layout and materials for the new housing developments, then the question would be **'Why UK property developers design the houses the way they do?'** This study aims to consider your view to improve the design of new build houses in the UK and identify the barriers preventing UK housing developers from change.

NOTE/ New build houses are (Houses being built in the last 15 years)

1. **What percentage of people asking to purchase or rent a new build house?**

   - Aged below 50 years old 80 %
   - Aged above 50 years old 20 %

   Any comments

2. **Do you sell most of the new build houses to?**

   - First time buyers %
   - Non first time buyers %
   - Investment property buyers %

   Any comments

3. **Do you sell most of the new build houses to First Time Buyers because of?**

   - Government first time buyer scheme is only for new build homes ...
   - Developers marketing tool such as choice of flooring, kitchen style, car ...
   - Personal interest of buying a new house just because it is new ...

4. **Any difficulties or specific barriers to sell or rent out a new build house?**

		1 Very Important	2 Less important	3 NOT important
1	Cost (affordability)	☑	☐	☐
2	Lack of architecture	☐	☐	☑
3	Lack of car park	☑	☐	☐
4	Small room size	☑	☐	☐
5	Quality of materials	☑	☐	☐
6	Small size gardens	☐	☐	☑
7	Others (please specify)			

SOUND INSULATION

5. **Do you think most of the customers prefer to live in a new build houses or an old house if the COST is not the barrier?**

- Customers prefer to live in a new build houses 40 %
- Customers prefer to live in an old house 60 %

6. **Any specific features ATTRACT or DETRACT the customer to buy or rent a new build house?**

	ATTRACT	DETRACT
A cellar or Basement	☑	☐
Flat roof	☐	☑
Internal Spaces layout	☑	☐
Private car park	☑	☐
Advanced Technology	☑	☐
House appearance	☑	☐
Warranty	☑	☐
Small rooms	☐	☑
Small garden	☐	☑
Quality of materials	☐	☑
Narrow house front	☐	☑
Lack of architectural characteristic or identity	☐	☑
Others (please specify)		

7. **How British houses can be improved?**

	Very Important	Less important	NOT important
Architecturally	☑	☐	☐
Materials quality	☑	☐	☐
Energy efficiency	☑	☐	☐
Larger rooms	☑	☐	☐
Larger garden	☐	☑	☐
Cost	☑	☐	☐
Larger spaces for car - parking and wheelie bins	☑	☐	☐
Others (please specify)			

8. **Do you get any feedback from your customers on?**

- Design
- Maintenance
- Material quality
- ☑ Spaces
- Energy
- Others (please specify)
- Are you aware of any comments which are related to the **culture origin** of the buyer?

Any comments: PEOPLE LOOKING MORE TOWARDS OPEN PLAN LIVING STANDARD. (FROM ABROAD) UK ARCHITECTS — CONTEMPORARY/MODERNISTIC LIVING.

Now it is all about you!

9. Do you live in an old house or a new build house?

- o Old house
- o New build house

10. If you live in an old house WHY you didn't buy or rent a new build house?

	Very Important	Less Important	NOT Important
o Expensive to buy or to rent	☐	☑	☐
o Expensive to run	☐	☑	☐
o Small rooms	☑	☐	☐
o Small garden	☑	☐	☐
o Low quality materials	☑	☐	☐
o Lack of spaces for car parking and wheelie bins	☑	☐	☐
o Others (please specify)	☐	☐	☐

CHOSE OLD WITH WORK TO SET MADE FOR MY MONEY/CHARACTER.

11. Do you think we are providing enough good quality houses in term of?

	Very Good	Good	OK	Poor	Very Poor
o Architecture characteristic (identity)	☐	☐	☑	☐	☐
o Material	☐	☐	☑	☐	☐
o Internal spaces	☐	☐	☐	☑	☐
o Cost (affordability)	☐	☐	☐	☑	☐
o Energy efficiency	☐	☑	☐	☐	☐
o Garden	☐	☑	☐	☐	☐
o Outside parking spaces	☐	☑	☐	☐	☐

Any extra comments:

I LIVE IN EDUCATIVE, APPROPRIATE HOUSING W/ POTENTIAL FOR PROFIT IN THE FUTURE. MOVED FROM BIRMINGHAM TO GET MORE FOR MY MONEY.

ARAZ AGHA / Coventry University / Department of Civil Engineering, Architecture & Building

John Laing Building , Much Park Street, CV1 2LT, Coventry , Room:JL131

Email- ab4146@coventry.ac.uk Mobil No: 077 429 86008 Office No: 02477657950

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Coventry University

OPTIMISING THE DESIGN OF NEW HOUSING IN THE UK

As we know most of the British houses designed as some of the smallest, most expensive and most energy profligate housing in Europe, UK developers still replicating the post war housing design, layout and materials for the new housing developments, then the question would be **'Why UK property developers design the houses the way they do?'** This study aims to consider your view to improve the design of new build houses in the UK and identify the barriers preventing UK housing developers from change.

NOTE/ New build houses are (Houses being built in the last 15 years)

1. What percentage of people asking to purchase or rent a new build house?

- Aged below 50 years old 60%
- Aged above 50 years old 40%

Any comments

2. Do you sell most of the new build houses to?

- First time buyers %
- Non first time buyers %
- Investment property buyers %

Any comments
UNKNOWN AS DEAL WITH ONLY LETTINGS.

3. Do you sell most of the new build houses to First Time Buyers because of?

- Government first time buyer scheme is only for new build homes ...
- Developers marketing tool such as choice of flooring, kitchen style, car ... UNKNOWN
- Personal interest of buying a new house just because it is new ... AS ABOVE

4. Any difficulties or specific barriers to sell or rent out a new build house?

		1 Very Important	2 Less important	3 NOT important
1	Cost (affordability)	☑	☐	☐
2	Lack of architecture	☐	☐	☑
3	Lack of car park	☑	☐	☐
4	Small room size	☑	☐	☐
5	Quality of materials	☑	☐	☐
6	Small size gardens	☐	☑	☐
7	Others (please specify)			

5. **Do you think most of the customers prefer to live in a new build houses or an old house if the COST is not the barrier?**
   - Customers prefer to live in a new build houses 60 %
   - Customers prefer to live in an old house 40 %

6. **Any specific features ATTRACT or DETRACT the customer to buy or rent a new build house?**

	ATTRACT	DETRACT
A cellar or Basement		
Flat roof		
Internal Spaces layout		
Private car park		
Advanced Technology		
House appearance		
Warranty		
Small rooms		
Small garden		
Quality of materials		
Narrow house front		
Lack of architectural characteristic or identity		
Others (please specify)		

7. **How British houses can be improved?**

	Very Important	Less Important	NOT important
Architecturally			
Materials quality			
Energy efficiency			
Larger rooms			
Larger garden			
Cost			
Larger spaces for car - parking and wheelie bins			
Others (please specify)			

8. **Do you get any feedback from your customers on?**
   - Design
   - Maintenance
   - Material quality
   - Spaces
   - Energy
   - Others (please specify)
   - Are you aware of any comments which are related to the **culture origin** of the buyer?

Any comments

Now it is all about you!

9. Do you live in an old house or a new build house?

- o Old house
- o New build house

10. If you live in an old house WHY you didn't ~~buy~~ or rent a new build house? Live with Parents.

	Very Important	Less important	NOT important
o Expensive to buy or to rent	☐	☐	☐
o Expensive to run	☐	☐	☐
o Small rooms	☐	☐	☐
o Small garden	☐	☐	☐
o Low quality materials	☐	☐	☐
o Lack of spaces for car parking and wheelie bins	☐	☐	☐
o Others (please specify)	☐	☐	☐

11. Do you think we are providing enough good quality houses in term of?

	Very Good	Good	OK	Poor	Very Poor
o Architecture characteristic (Identity)	☐	☐	☐	☑	☐
o Material	☐	☐	☑	☐	☐
o Internal spaces	☐	☐	☑	☐	☐
o Cost (affordability)	☐	☐	☑	☐	☐
o Energy efficiency	☐	☐	☑	☐	☐
o Garden	☐	☐	☑	☐	☐
o Outside parking spaces	☐	☐	☑	☐	☐

Any extra comments:

ARAZ AGHA / Coventry University / Department of Civil Engineering, Architecture & Building

John Laing Building , Much Park Street, CV1 2LT, Coventry , Room:JL131

Email- ab4146@coventry.ac.uk Mobil No: 077 429 86008 Office No: 02477657950

Croydon London

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Coventry University

OPTIMISING THE DESIGN OF NEW HOUSING IN THE UK

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NOTE/ New build houses are (Houses being built in the last 15 years)

1. What percentage of people asking to purchase or rent a new build house?

- Aged below 50 years old 90% 10
- Aged above 50 years old 10% 10

Any comments
Mainly people ask for victorian/edwardian for character / ceiling height etc

2. Do you sell most of the new build houses to?

- First time buyers 80%
- Non first time buyers %
- Investment property buyers 20%

Any comments

3. Do you sell most of the new build houses to First Time Buyers because of?

- Government first time buyer scheme is only for new build homes ...
- ✓ Developers marketing tool such as choice of flooring, kitchen style, car ...
- Personal interest of buying a new house just because it is new ...

4. Any difficulties or specific barriers to sell or rent out a new build house?

		1 Very Important	2 Less Important	3 NOT important
1	Cost (affordability)			✓
2	Lack of architecture	✓		
3	Lack of car park			✓
4	Small room size	✓		
5	Quality of materials		✓	
6	Small size gardens	✓		
7	Others (please specify)			

5. **Do you think most of the customers prefer to live in a new build houses or an old house if the COST is not the barrier?**
   - o Customers prefer to live in a new build houses 20%
   - o Customers prefer to live in an old house 80%

6. **Any specific features ATTRACT or DETRACT the customer to buy or rent a new build house?**

	ATTRACT	DETRACT
o A cellar or Basement	☐	☐
o Flat roof	☐	☑
o Internal Spaces layout	☑	☐
o Private car park	☑	☐
o Advanced Technology	☐	☐
o House appearance	☑	☐
o Warranty	☑	☐
o Small rooms	☐	☑
o Small garden	☐	☑
o Quality of materials	☐	☑
o Narrow house front	☐	☑
o Lack of architectural characteristic or identity	☐	☑
o Others (please specify)		

7. **How British houses can be improved?**

	Very Important	Less Important	NOT important
o Architecturally	☑	☐	☐
o Materials quality	☐	☑	☐
o Energy efficiency	☑	☐	☐
o Larger rooms	☑	☐	☐
o Larger garden	☐	☐	☐
o Cost	☐	☑	☐
o Larger spaces for car - parking and wheelie bins	☑	☐	☐
o Others (please specify)			

8. **Do you get any feedback from your customers on?**
   - o Design
   - o Maintenance
   - o Material quality
   - ✓ Spaces
   - o Energy
   - o Others (please specify)
   - o Are you aware of any comments which are related to the culture origin of the buyer?

Any comments

Now it is all about you!

9. Do you live in an old house or a new build house?

- o Old house
- o New build house

10. If you live in an old house WHY you didn't buy or rent a new build house?

	Very Important	Less important	NOT important
o Expensive to buy or to rent	☐	☐	☐
o Expensive to run	☐	☐	☐
o Small rooms	☑	☐	☐
o Small garden	☑	☐	☐
o Low quality materials	☐	☐	☐
o Lack of spaces for car parking and wheelie bins	☑	☐	☐
o Others (please specify)	☐	☐	☐

11. Do you think we are providing enough good quality houses in term of?

	Very Good	Good	OK	Poor	Very Poor
o Architecture characteristic (Identity)	☐	☐	☐	☑	☐
o Material	☐	☐	☑	☐	☐
o Internal spaces	☐	☐	☐	☑	☐
o Cost (affordability)	☐	☐	☑	☐	☐
o Energy efficiency	☐	☐	☑	☐	☐
o Garden	☐	☐	☐	☑	☐
o Outside parking spaces	☐	☐	☐	☑	☐

Any extra comments:

ARAZ AGHA / Coventry University / Department of Civil Engineering, Architecture & Building

John Laing Building , Much Park Street, CV1 2LT, Coventry , Room-JL131

Email- ab4146@coventry.ac.uk Mobil No: 077 429 86008 Office No: 02477657950

Croydon London

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Coventry University

OPTIMISING THE DESIGN OF NEW HOUSING IN THE UK

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NOTE/ New build houses are (Houses being built in the last 15 years)

1. **What percentage of people asking to purchase or rent a new build house?**

   - Aged below 50 years old 90 %
   - Aged above 50 years old 10 %

   Any comments

2. **Do you sell most of the new build houses to?**

   - First time buyers 50 %
   - Non first time buyers 10 %
   - Investment property buyers 40 %

   Any comments

3. **Do you sell most of the new build houses to First Time Buyers because of?**

   - Government first time buyer scheme is only for new build homes .... ✓
   - Developers marketing tool such as choice of flooring, kitchen style, car ...
   - Personal interest of buying a new house just because it is new ...

4. **Any difficulties or specific barriers to sell or rent out a new build house?**

		1 Very Important	2 Less important	3 NOT important
1	Cost (affordability)	☑	☐	☐
2	Lack of architecture	☑	☐	☐
3	Lack of car park	☐	☑	☐
4	Small room size	☐	☑	☐
5	Quality of materials	☐	☐	☑
6	Small size gardens	☐	☑	☐
7	Others (please specify)			

5. **Do you think most of the customers prefer to live in a new build houses or an old house if the COST is not the barrier?**

- Customers prefer to live in a new build houses 80 %
- Customers prefer to live in an old house 20 %

6. **Any specific features ATTRACT or DETRACT the customer to buy or rent a new build house?**

	ATTRACT	DETRACT
A cellar or Basement	☑	☐
Flat roof	☐	☑
Internal Spaces layout	☑	☐
Private car park	☑	☐
Advanced Technology	☑	☐
House appearance	☑	☐
Warranty	☑	☐
Small rooms	☐	☑
Small garden	☐	☑
Quality of materials	☐	☑
Narrow house front	☐	☑
Lack of architectural characteristic or identity	☐	☑
Others (please specify)		

7. **How British houses can be improved?**

	Very Important	Less Important	NOT Important
Architecturally	☑	☐	☐
Materials quality	☐	☑	☐
Energy efficiency	☐	☑	☐
Larger rooms	☑	☐	☐
Larger garden	☐	☑	☐
Cost	☑	☐	☐
Larger spaces for car - parking and wheelie bins	☐	☑	☐
Others (please specify)			

8. **Do you get any feedback from your customers on?**

- Design ✓
- Maintenance ✓
- Material quality
- Spaces ✓
- Energy
- Others (please specify)
- Are you aware of any comments which are related to the **culture origin** of the buyer?

Any comments

15

Now it is all about you!

9. Do you live in an old house or a new build house?

- o Old house ✓
- o New build house

10. If you live in an old house WHY you didn't buy or rent a new build house?

	Very Important	Less important	NOT important
o Expensive to buy or to rent	✓		
o Expensive to run			✓
o Small rooms	✓		
o Small garden	✓		
o Low quality materials		✓	
o Lack of spaces for car parking and wheelie bins		✓	
o Others (please specify)		✓	

11. Do you think we are providing enough good quality houses in term of?

	Very Good	Good	OK	Poor	Very Poor
o Architecture characteristic (Identity)		✓			
o Material		✓			
o Internal spaces		✓			
o Cost (affordability)			✓		
o Energy efficiency		✓			
o Garden			✓		
o Outside parking spaces			✓		

Any extra comments:

ARAZ AGHA / Coventry University / Department of Civil Engineering, Architecture & Building

John Laing Building , Much Park Street, CV1 2LT, Coventry , Room:JL131

Email- ab4146@coventry.ac.uk Mobil No: 077 429 86008 Office No: 02477657950

Sales / Wage

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Coventry University

OPTIMISING THE DESIGN OF NEW HOUSING IN THE UK

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NOTE/ New build houses are (Houses being built in the last 15 years)

1. What percentage of people asking to purchase or rent a new build house?

- ✓ Aged below 50 years old 75%
- ○ Aged above 50 years old 25%

Any comments

2. Do you sell most of the new build houses to?

- ✓ First time buyers %
- ✓ Non first time buyers %
- ✓ Investment property buyers %

Any comments

3. Do you sell most of the new build houses to First Time Buyers because of?

- ✓ Government first time buyer scheme is only for new build homes ...
- ✓ Developers marketing tool such as choice of flooring, kitchen style, car ...
- ✓ Personal interest of buying a new house just because it is new ...

4. Any difficulties or specific barriers to sell or rent out a new build house?

		1 Very Important	2 Less important	3 NOT important
1	○ Cost (affordability)	☐	☐	☐
2	○ Lack of architecture	☑	☐	☐
3	○ Lack of car park	☑	☐	☐
4	○ Small room size	☐	☑	☐
5	○ Quality of materials	☑	☐	☐
6	○ Small size gardens	☑	☐	☐
7	○ Others (please specify)	☐	☐	☐

5. **Do you think most of the customers prefer to live in a new build houses or an old house if the COST is not the barrier?**

- o Customers prefer to live in a new build houses %
- o Customers prefer to live in an old house %

6. **Any specific features ATTRACT or DETRACT the customer to buy or rent a new build house?**

	ATTRACT	DETRACT
o A cellar or Basement	☐	☐
o Flat roof	☐	☐
o Internal Spaces layout	☐	☐
o Private car park	☑	☐
o Advanced Technology	☐	☑
o House appearance	☑	☐
o Warranty	☑	☐
o Small rooms	☐	☑
o Small garden	☑	☐
o Quality of materials	☐	☐
o Narrow house front	☐	☑
o Lack of architectural characteristic or identity	☑	☐
o Others (please specify)		

7. **How British houses can be improved?**

	Very Important	Less important	NOT important
o Architecturally	☐	☐	☐
o Materials quality	☐	☐	☐
o Energy efficiency	☐	☐	☐
o Larger rooms	☐	☐	☐
o Larger garden	☐	☐	☐
o Cost	☐	☐	☐
o Larger spaces for car - parking and wheelie bins	☑	☐	☐
o Others (please specify)			

8. **Do you get any feedback from your customers on?**

- o Design
- o Maintenance
- o Material quality
- o Spaces
- o Energy
- o Others (please specify)
- o Are you aware of any comments which are related to the **culture origin** of the buyer?

Any comments

5. **Do you think most of the customers prefer to live in a new build houses or an old house if the COST is not the barrier?**

- o Customers prefer to live in a new build houses %
- o Customers prefer to live in an old house %

6. **Any specific features ATTRACT or DETRACT the customer to buy or rent a new build house?**

	ATTRACT	DETRACT
o A cellar or Basement	☐	☐
o Flat roof	☐	☐
o Internal Spaces layout	☐	☐
o Private car park	☑	☐
o Advanced Technology	☐	☑
o House appearance	☑	☐
o Warranty	☑	☐
o Small rooms	☐	☑
o Small garden	☑	☐
o Quality of materials	☐	☑
o Narrow house front	☐	☐
o Lack of architectural characteristic or identity	☑	☐
o Others (please specify)		

7. **How British houses can be improved?**

	Very Important	Less important	NOT important
o Architecturally	☑	☐	☐
o Materials quality	☑	☐	☐
o Energy efficiency	☑	☐	☐
o Larger rooms	☑	☐	☐
o Larger garden	☑	☐	☐
o Cost	☑	☐	☐
o Larger spaces for car - parking and wheelie bins	☑	☐	☐
o Others (please specify)			

8. **Do you get any feedback from your customers on?**

- ☑ Design
- ☑ Maintenance
- o Material quality
- ☑ Spaces
- o Energy
- o Others (please specify)
- o Are you aware of any comments which are related to the **culture origin** of the buyer?

Any comments

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Coventry University

OPTIMISING THE DESIGN OF NEW HOUSING IN THE UK

As we know most of the British houses designed as some of the smallest, most expensive and most energy profligate housing in Europe, UK developers still replicating the post war housing design, layout and materials for the new housing developments, then the question would be **'Why UK property developers design the houses the way they do?'** This study aims to consider your view to improve the design of new build houses in the UK and identify the barriers preventing UK housing developers from change.

NOTE/ New build houses are (Houses being built in the last 15 years)

1. What percentage of people asking to purchase or rent a new build house?

- ✓ Aged below 50 years old %
- ○ Aged above 50 years old %

Any comments

2. Do you sell most of the new build houses to?

- ✓ First time buyers %
- ○ Non first time buyers %
- ○ Investment property buyers %

Any comments

3. Do you sell most of the new build houses to First Time Buyers because of?

- ✓ Government first time buyer scheme is only for new build homes ...
- ○ Developers marketing tool such as choice of flooring, kitchen style, car ...
- ○ Personal interest of buying a new house just because it is new ...

4. Any difficulties or specific barriers to sell or rent out a new build house?

		1 Very Important	2 Less important	3 NOT important
1	○ Cost (affordability)	✓	☐	☐
2	○ Lack of architecture	☐	☐	☐
3	○ Lack of car park	✓	☐	☐
4	○ Small room size	☐	☐	☐
5	○ Quality of materials	☐	☐	☐
6	✓ Small size gardens	☐	☐	☐
7	○ Others (please specify)			

5. **Do you think most of the customers prefer to live in a new build houses or an old house if the COST is not the barrier?**

- o Customers prefer to live in a new build houses %
- o Customers prefer to live in an old house %

6. **Any specific features ATTRACT or DETRACT the customer to buy or rent a new build house?**

	ATTRACT	DETRACT
o A cellar or Basement	☑	☐
o Flat roof	☐	☑
o Internal Spaces layout	☐	☑
o Private car park	☑	☐
o Advanced Technology	☑	☐
o House appearance	☑	☐
o Warranty	☑	☐
o Small rooms	☐	☑
o Small garden	☐	☑
o Quality of materials	☑	☐
o Narrow house front	☐	☑
o Lack of architectural characteristic or identity	☐	☐
o Others (please specify)		

7. **How British houses can be improved?**

	Very important	Less important	NOT important
o Architecturally	☐	☑	☐
o Materials quality	☐	☑	☐
o Energy efficiency	☐	☑	☐
o Larger rooms	☑	☐	☐
o Larger garden	☑	☐	☐
o Cost	☑	☐	☐
o Larger spaces for car - parking and wheelie bins	☑	☐	☐
o Others (please specify)			

8. **Do you get any feedback from your customers on?**

- o Design
- o Maintenance
- o Material quality
- o Spaces
- o Energy
- o Others (please specify)
- o Are you aware of any comments which are related to the **culture origin** of the buyer?

Any comments

1 5

Coventry University

OPTIMISING THE DESIGN OF NEW HOUSING IN THE UK

As we know most of the British houses designed as some of the smallest, most expensive and most energy profligate housing in Europe, UK developers still replicating the post war housing design, layout and materials for the new housing developments, then the question would be **'Why UK property developers design the houses the way they do?'** This study aims to consider your view to improve the design of new build houses in the UK and identify the barriers preventing UK housing developers from change.

NOTE/ New build houses are (Houses being built in the last 15 years)

1. What percentage of people asking to purchase or rent a new build house?

- Aged below 50 years old 50 %
- Aged above 50 years old 20 %

Any comments

2. Do you sell most of the new build houses to?

- First time buyers 50 %
- Non first time buyers 30 %
- Investment property buyers 20 %

Any comments

3. Do you sell most of the new build houses to First Time Buyers because of?

- Government first time buyer scheme is only for new build homes ...
- Developers marketing tool such as choice of flooring, kitchen style, car ...
- Personal interest of buying a new house just because it is new ...

4. Any difficulties or specific barriers to sell or rent out a new build house?

	Very Important	Less important	NOT important
Cost (affordability)	☐	☑	☐
Lack of architecture	☐	☑	☐
Lack of car park	☑	☐	☐
Small room size	☑	☐	☐
Quality of materials	☐	☑	☐
Small size gardens	☑	☐	☐
Others (please specify)			

5. **Do you think most of the customers prefer to live in a new build houses or an old house if the COST is not the barrier?**

- Customers prefer to live in a new build houses 40 %
- Customers prefer to live in an old house 60 %

6. **Any specific features ATTRACT or DETRACT the customer to buy or rent a new build house?**

	ATTRACT	DETRACT
A cellar or Basement	☐	☑
Flat roof	☐	☑
Internal Spaces layout	☐	☑
Private car park	☑	☐
Advanced Technology	☑	☐
House appearance	☑	☐
Warranty	☑	☐
Small rooms	☐	☑
Small garden	☐	☑
Quality of materials	☑	☐
Narrow house front	☐	☑
Lack of architectural characteristic or identity	☐	☑
Others (please specify)		

7. **How British houses can be improved?**

	Very important	Less important	NOT important
Architecturally	☑	☐	☐
Materials quality	☑	☐	☐
Energy efficiency	☑	☐	☐
Larger rooms	☑	☐	☐
Larger garden	☐	☑	☐
Cost	☑	☐	☐
Larger spaces for car - parking and wheelie bins	☑	☐	☐
Others (please specify)			

8. **Do you get any feedback from your customers on?**

- Design
- Maintenance
- Material quality
- Spaces
- Energy
- Others (please specify)
- Are you aware of any comments which are related to the **culture origin** of the buyer?

Any comments

Now it is all about you!

9. Do you live in an old house or a new build house?

- o Old house
- o New build house

10. If you live in an old house WHY you didn't buy or rent a new build house?

	Very Important	Less important	NOT important
o Expensive to buy or to rent	☐	☐	☒
o Expensive to run	☐	☐	☒
o Small rooms	☒	☐	☐
o Small garden	☒	☐	☐
o Low quality materials	☐	☒	☐
o Lack of spaces for car parking and wheelie bins	☐	☒	☐
o Others (please specify)	☐	☐	☐

Lack of Character

11. Do you think we are providing enough good quality houses in term of?

	Very Good	Good	OK	Poor	Very Poor
o Architecture characteristic (Identity)	☐	☐	☒	☐	☐
o Material	☐	☐	☒	☐	☐
o Internal spaces	☐	☐	☐	☒	☐
o Cost (affordability)	☐	☐	☒	☐	☐
o Energy efficiency	☐	☒	☐	☐	☐
o Garden	☐	☐	☒	☐	☐
o Outside parking spaces	☐	☐	☒	☐	☐

Any extra comments:

ARAZ AGHA / Coventry University / Department of Civil Engineering, Architecture & Building

John Laing Building , Much Park Street, CV1 2LT, Coventry , Room:JL131

Email- ab4146@coventry.ac.uk Mobil No: 077 429 86008 Office No: 02477657950

Croydon London

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Coventry University

OPTIMISING THE DESIGN OF NEW HOUSING IN THE UK

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NOTE/ New build houses are (Houses being built in the last 15 years)

1. What percentage of people asking to purchase or rent a new build house?

- ✓ Aged below 50 years old %
- Aged above 50 years old %

Any comments

2. Do you sell most of the new build houses to?

- ✓ First time buyers %
- Non first time buyers %
- Investment property buyers %

Any comments

3. Do you sell most of the new build houses to First Time Buyers because of?

- Government first time buyer scheme is only for new build homes ...
- Developers marketing tool such as choice of flooring, kitchen style, car ...
- ✓ Personal interest of buying a new house just because it is new ...

4. Any difficulties or specific barriers to sell or rent out a new build house?

		1 Very Important	2 Less important	3 NOT important
1	Cost (affordability)	☑	☐	☐
2	Lack of architecture	☐	☑	☐
3	Lack of car park	☑	☐	☐
4	Small room size	☑	☐	☐
5	Quality of materials	☐	☑	☐
6	Small size gardens	☐	☑	☐
7	Others (please specify)			

5. **Do you think most of the customers prefer to live in a new build houses or an old house if the COST is not the barrier?**
   - ✓ Customers prefer to live in a new build houses 40% Old because
   - ✓ Customers prefer to live in an old house 60 % more Size

6. **Any specific features ATTRACT or DETRACT the customer to buy or rent a new build house?**

	ATTRACT	DETRACT
o A cellar or Basement	✓	
o Flat roof		✓
o Internal Spaces layout	✓	
o Private car park	✓	
o Advanced Technology		✓
o House appearance	✓	
o Warranty		
o Small rooms		✓
o Small garden	✓	
o Quality of materials	✓	
o Narrow house front		✓
o Lack of architectural characteristic or identity		✓
o Others (please specify)		

7. **How British houses can be improved?**

	Very Important	Less important	NOT important
o Architecturally		✓	
o Materials quality		✓	
o Energy efficiency	✓		
o Larger rooms	✓		
o Larger garden		✓	
o Cost	✓		
o Larger spaces for car - parking and wheelie bins	✓		
o Others (please specify)			

8. **Do you get any feedback from your customers on?**
   - o Design
   - o Maintenance
   - o Material quality
   - ✓ Spaces
   - ✓ Energy
   - o Others (please specify)
   - o Are you aware of any comments which are related to the **culture origin** of the buyer?

Any comments

Now it is all about you!

9. Do you live in an old house or a new build house?

- ✓ Old house
- ○ New build house

10. If you live in an old house WHY you didn't buy or rent a new build house?

	Very Important	Less Important	NOT important
○ Expensive to buy or to rent	☑	☐	☐
○ Expensive to run	☐	☑	☐
○ Small rooms	☑	☐	☐
○ Small garden	☑	☐	☐
○ Low quality materials	☐	☑	☐
○ Lack of spaces for car parking and wheelie bins	☑	☐	☐
○ Others (please specify)	☐	☐	☐

11. Do you think we are providing enough good quality houses in term of?

	Very Good	Good	OK	Poor	Very Poor
○ Architecture characteristic (Identity)	☐	☐	☑	☐	☐
○ Material	☐	☐	☑	☐	☐
○ Internal spaces	☐	☐	☐	☑	☐
○ Cost (affordability)	☐	☐	☐	☑	☐
○ Energy efficiency	☐	☑	☐	☐	☐
○ Garden	☐	☐	☐	☑	☐
○ Outside parking spaces	☐	☐	☑	☐	☐

Any extra comments:

ARAZ AGHA / Coventry University / Department of Civil Engineering, Architecture & Building

John Laing Building , Much Park Street, CV1 2LT, Coventry , Room: JL131

Email- ab4146@coventry.ac.uk Mobil No: 077 429 86008 Office No: 02477657950

Coventry University

OPTIMISING THE DESIGN OF NEW HOUSING IN THE UK

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NOTE/ New build houses are (Houses being built in the last 15 years)

1. **What percentage of people asking to purchase or rent a new build house?**

- Aged below 50 years old 75 %
- Aged above 50 years old 25 %

Any comments

2. **Do you sell most of the new build houses to?**

- First time buyers 75 %
- Non first time buyers %
- Investment property buyers 25 %

Any comments

3. **Do you sell most of the new build houses to First Time Buyers because of?**

- Government first time buyer scheme is only for new build homes ...
- Developers marketing tool such as choice of flooring, kitchen style, car ...
- Personal interest of buying a new house just because it is new ...

4. **Any difficulties or specific barriers to sell or rent out a new build house?**

	1 Very Important	2 Less important	3 NOT important
1 Cost (affordability)	☒	☐	☐
2 Lack of architecture	☒	☐	☐
3 Lack of car park	☒	☐	☐
4 Small room size	☒	☐	☐
5 Quality of materials	☐	☒	☐
6 Small size gardens	☐	☒	☐
7 Others (please specify)			

5. **Do you think most of the customers prefer to live in a new build houses or an old house if the COST is not the barrier?**
   - Customers prefer to live in a new build houses 25 %
   - Customers prefer to live in an old house 75 %

6. **Any specific features ATTRACT or DETRACT the customer to buy or rent a new build house?**

	ATTRACT	DETRACT
A cellar or Basement	☒	☐
Flat roof	☐	☒
Internal Spaces layout	☐	☒
Private car park	☒	☐
Advanced Technology	☒	☐
House appearance	☒	☐
Warranty	☒	☐
Small rooms	☐	☒
Small garden	☐	☒
Quality of materials	☐	☒
Narrow house front	☐	☒
Lack of architectural characteristic or identity	☐	☒
Others (please specify)		

7. **How British houses can be improved?**

	Very Important	Less Important	NOT important
Architecturally	☒	☐	☐
Materials quality	☒	☐	☐
Energy efficiency	☐	☒	☐
Larger rooms	☒	☐	☐
Larger garden	☐	☐	☐
Cost	☒	☐	☐
Larger spaces for car - parking and wheelie bins	☒	☐	☐
Others (please specify)			

8. **Do you get any feedback from your customers on?**
   - Design
   - Maintenance
   - Material quality
   - Spaces
   - Energy
   - Others (please specify) Car Park
   - Are you aware of any comments which are related to the **culture origin** of the buyer?

Any comments

Now it is all about you!

9. Do you live in an old house or a new build house?

- o Old house
- o New build house

10. If you live in an old house WHY you didn't buy or rent a new build house?

	Very Important	Less important	NOT important
o Expensive to buy or to rent	☑	☐	☐
o Expensive to run	☐	☑	☐
o Small rooms	☑	☐	☐
o Small garden	☐	☑	☐
o Low quality materials	☑	☐	☐
o Lack of spaces for car parking and wheelie bins	☑	☐	☐
o Others (please specify)	☐	☐	☐

11. Do you think we are providing enough good quality houses in term of?

	Very Good	Good	OK	Poor	Very Poor
o Architecture characteristic (Identity)	☑	☐	☐	☐	☑
o Material	☐	☑	☐	☑	☐
o Internal spaces	☑	☐	☐	☐	☑
o Cost (affordability)	☑	☐	☐	☐	☑
o Energy efficiency	☐	☑	☐	☐	☐
o Garden	☐	☑	☐	☑	☐
o Outside parking spaces	☑	☐	☐	☐	☑

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ARAZ AGHA / Coventry University / Department of Civil Engineering, Architecture & Building

John Laing Building , Much Park Street, CV1 2LT, Coventry , Room-JL131

Email- ab4146@coventry.ac.uk Mobil No: 077 429 86008 Office No: 02477657950

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NOTE/ New build houses are (Houses being built in the last 15 years)

1. What percentage of people asking to purchase or rent a new build house?

- o Aged below 50 years old 75%
- o Aged above 50 years old 25%

Any comments

2. Do you sell most of the new build houses to?

- o First time buyers 75 %
- o Non first time buyers %
- o Investment property buyers 25%

Any comments

3. Do you sell most of the new build houses to First Time Buyers because of?

- o Government first time buyer scheme is only for new build homes ...
- o Developers marketing tool such as choice of flooring, kitchen style, car ...
- o Personal interest of buying a new house just because it is new ...

4. Any difficulties or specific barriers to sell or rent out a new build house?

		1 Very Important	2 Less important	3 NOT important
1	o Cost (affordability)	☑	☐	☐
2	o Lack of architecture	☑	☐	☐
3	o Lack of car park	☑	☐	☐
4	o Small room size	☑	☐	☐
5	o Quality of materials	☐	☑	☐
6	o Small size gardens	☑	☐	☐
7	o Others (please specify)			

5. **Do you think most of the customers prefer to live in a new build houses or an old house if the COST is not the barrier?**
   - o Customers prefer to live in a new build houses 25%
   - o Customers prefer to live in an old house 75%

6. **Any specific features ATTRACT or DETRACT the customer to buy or rent a new build house?**

		ATTRACT (1)	DETRACT (2)
1	A cellar or Basement	☑	☐
2	Flat roof	☐	☑
3	Internal Spaces layout	☐	☑
4	Private car park	☑	☐
5	Advanced Technology	☑	☐
6	House appearance	☑	☐
7	Warranty	☑	☐
8	Small rooms	☑	☐
9	Small garden	☐	☑
10	Quality of materials	☐	☑
11	Narrow house front	☐	☑
12	Lack of architectural characteristic or identity	☐	☑
13	Others (please specify)		

7. **How British houses can be improved?**

	Very Important	Less important	NOT important
o Architecturally	☑	☐	☐
o Materials quality	☐	☑	☐
o Energy efficiency	☐	☑	☐
o Larger rooms	☑	☐	☐
o Larger garden	☐	☑	☐
o Cost	☑	☐	☐
o Larger spaces for car - parking and wheelie bins	☑	☐	☐
o Others (please specify)			

8. **Do you get any feedback from your customers on?**
   - o Design
   - o Maintenance
   - o Material quality
   - ✓ Spaces
   - o Energy
   - o Others (please specify)
   - o Are you aware of any comments which are related to the **culture origin** of the buyer?

Any comments Car park.

Now it is all about you!

9. **Do you live in an old house or a new build house?**
   - o Old house
   - o New build house

10. **If you live in an old house WHY you didn't buy or rent a new build house?**

	Very Important	Less important	NOT important
o Expensive to buy or to rent	☑	☐	☐
o Expensive to run	☐	☑	☐
o Small rooms	☑	☐	☐
o Small garden	☑	☐	☐
o Low quality materials	☐	☑	☐
o Lack of spaces for car parking and wheelie bins	☑	☐	☐
o Others (please specify)	☐	☐	☐

11. **Do you think we are providing enough good quality houses in term of?**

	Very Good	Good	OK	Poor	Very Poor
o Architecture characteristic (Identity)	☐	☐	☐	☐	☑
o Material	☐	☐	☐	☐	☑
o Internal spaces	☐	☐	☐	☐	☑
o Cost (affordability)	☐	☑	☐	☑	☐
o Energy efficiency	☐	☑	☐	☐	☐
o Garden	☐	☐	☐	☑	☐
o Outside parking spaces	☐	☐	☐	☐	☑

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ARAZ AGHA / Coventry University / Department of Civil Engineering, Architecture & Building

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Email- ab4146@coventry.ac.uk Mobil No: 077 429 86008 Office No: 02477657950